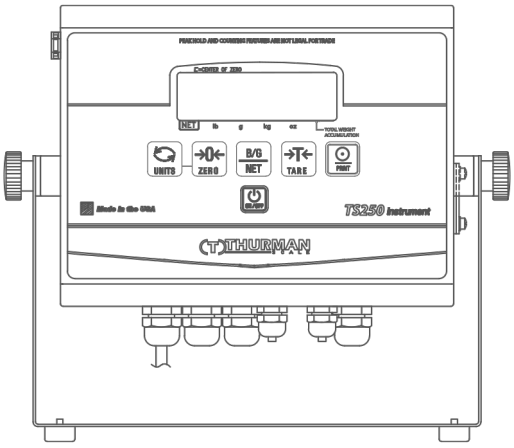
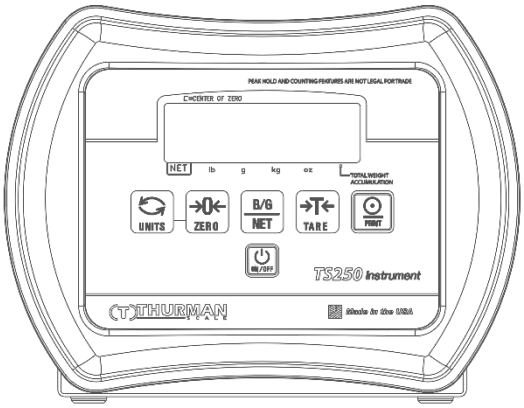
THURMAN SCALE

Operating Manual

TS250 Series Instrument and PC25X

PC Software Utility Program





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Amendment Record

TS250 Series Instrument
PC25X Utility Software
Document 51367

Manufactured by **Thurman Scale**
4025 Lakeview Crossing
Groveport, OH 43125

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Revision 1	02/2016	Released Manual
Revision 2	02/2016	Updated AutoTare and manual tare instructions
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Revision 4	04/2016	Added TM-U220 Tape Printer Information
Revision 5	08/2019	Updated 4-20mA instructions and added new Monorail information
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Disclaimer

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Table of Contents

Section 1: General Information

1.1. MODEL DESCRIPTIONS

The TS250 is a general purpose weighing instrument that can be used with a wide variety of platforms and load receivers, and is available in nine (9) different configurations.

MODEL	PART NO.
• TS250 Series ABS, AC Power	34643
• TS250 Series ABS, AC/Battery Power	34660
• TS250 Series SS, AC Power	34644
• TS250 Series SS, AC/Battery Power	34661

1.2. MAIN PRODUCT FEATURES

Major features of the Instrument include the following.

- Push-button programming and calibration.
- Program data is stored in battery supported RAM and backed up in flash memory.
- The battery should be replaced every 12 months.
- The TS250 series instrument features a large one inch high green backlit LCD weight display, which can be tilted up or down to accommodate different lighting conditions. Microprocessor controlled design allows the instrument to be rapidly programmed at installation to meet the specific requirements of the application.
- The obtainable accuracy meets Handbook 44 requirements, and the instrument is approved for commercial application up to 10,000 divisions. A maximum of 100,000 displayed divisions can be programmed for non-commercial applications.
- A computer utility software program PC25X is available, via download from Thurman Intranet for programming via computer, and is required for certain features such as custom ticket formatting.
- The PC25X software utility program can also upload and modify the instruments set-up, configuration, and calibration. Saved information can be downloaded from a computer to the TS250 Series in the event of a catastrophic failure.
- The instrument provides two (2) serial communication ports to provide communication to various types of peripheral devices for RS232, RS422, RS485, and 20mA data outputs.
- Optional accessories include a 4-20mA analog output, Bluetooth® serial adapter, and five different fieldbus devices; Profibus®, DeviceNet™, ControlNet™, Modbus® TCP and Ethernet/IP.

1.3. SPECIFICATIONS

1.3.1. INSTRUMENT APPROVALS

• CC	15-099
• MC	AM-6002
• ETL	ETL Listed
• Conforms to ANSI/UL STD 60950-1	
• Certified to CAN/CSA C22.2 STD NO. 60950-1-03	

1.3.2. SPECIFICATIONS

• ENCLOSURE	ABS, Black NEMA 1, Stainless Steel NEMA 4X Desk and Wall Mount
• DISPLAY	6 digits, 1 inch LCD, Green Backlight
• FRONT PANEL KEYS	On/Off, Units, Zero, B/G, Net, Tare and Print
• UNITS	lbs, oz, kg, g and lbs/oz, or custom
• GRADUATION SIZE	0.0001 to 50
• AD CONVERSION	66 per second
• LOAD CELL EXCITATION	5 Volts DC
• SENSITIVITY	1µv/d (microvolt/division)
• LOAD CELLS	Eight (8) 350 ohm or Sixteen (16) 1000 ohm
• DISPLAYED DIVISIONS	10,000d Commercial and 100,000d Non-Commercial
• CAPACITIES	Programmable to 999999

1.3.3. SETTINGS

• Zero Range	**2 % or 100%**
• Auto Zero Tracking	**OFF, 0.5, 1 or 3 divisions**
• Balance	**OFF, 0.5, 1 or 3 divisions**
• Filter	**Slow, Cattle, Standard, and Fast**
• Display Update Rate	**0.2, 0.4, and 0.8 seconds**

1.3.4. WEIGHT ACCUMULATOR

• Capacity	**999,999 Weight Units** – Printed or viewed

1.3.5. OUTPUTS

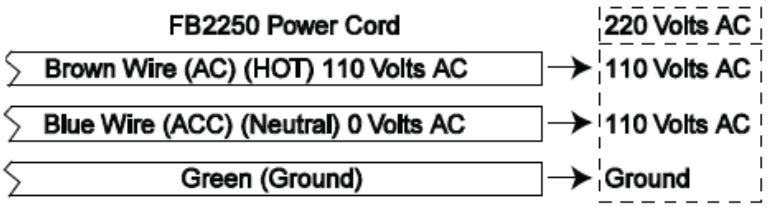
• PORT 1	Bidirectional Serial Port. Settings include **OFF, RS232**, **RS422**, and **RS485**. RS232 has 30+ updates a second
• PORT 2	Port 2 is used to interface to the **PC25X program**, OR to provide **20mA passive, RS232**, **RS422***, or **RS485.**

*Port should be set to RS485. Note jumper and wiring connections listed in **Section 5: Serial Communication Wiring.**

1.3.6. AC OPERATION

The TS250 is designed to operate from **80 to 260 volts AC, 50 to 60 Hertz** with **Auto Switching** capability.

- 110 Volt AC Operation
  - The TS250 is factory wired for 110 VAC and requires a three-prong grounded outlet.
- 220 Volt AC Operation
  - Rewire the power cord according to the following diagram:



- 1.5 watts maximum
- The TS250 is designed to operate from 80 to 260 volts AC, 50 to 60 Hertz

1.3.7. DC MODELS

• Batteries	Five (5) Size “D” Alkaline batteries @ 1.5 Volts DC each.
• Battery Life	Battery usage time can be adversely affected by battery storage, battery capacity and battery brand. To maximize battery life, serial Ports 1 and 2 should be switched OFF, if not used. (1) 350Ω load cell, Back Light = OFF, RS232 ports = OFF……55 hours (4) 350Ω load cell, Back Light = ON, RS232 ports = OFF……..…..16 hours (4) 350Ω load cell, Back Light = OFF, RS232 ports = OFF……..…33 hours
• Internal Battery	• Should be replaced every 12 months using Panasonic CR 1220 3V or equivalent.

1.3.8. OUT OF RANGE WARNINGS

• HiCAP	Scale input is over capacity
• - - - - - - -	Displayed weight exceeds 6 digits
• Sleep Mode	Settings include OFF, 1, 2, 5, 10, 20, and 30 minutes
• Time and	Battery Maintained

1.3.9. EXTERNAL PRINTERS

• **Tape Printers** – Citizens IDP 3550 and Epson Model TM-U220 Tape Printers
• **Serial Form Printers** – Okidata 184 & 186 Serial Form Printer
Okidata 420 Serial Form Printer
• **Ticket Printers** – Epson Models TM-U295, TM-U590 Ticket Printers

1.3.10. ENVIRONMENT

• Temperature	-10ºC to + 40ºC (+14ºF to + 104ºF)
• Storage Temp.	-40ºC to + 60ºC (-40ºF to + 140ºF)

1.3.11. PC25X

- Computer software utility program is available for download using the Thurman Intranet.
- PC25X is required for setting certain aspects of programming, such as custom Units and custom ticket formatting.

1.4. ACCESSORIES

Optional accessories include the following.

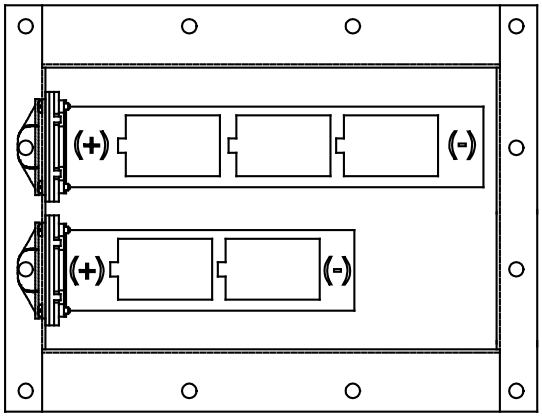
FIELDBUS DEVICES				
• DeviceNet™	• ControlNet™	• PROFIBUS®-DP	• Modbus®	• Ethernet/IP

4-20MA ANALOG CURRENT LOOP OUTPUT	
• 16 bit Resolution and Monotonicity	• 0.01% Non-Linearity
• Isolated 4mA to 20mA	• Front Panel Programmable or via PC25X utility software program

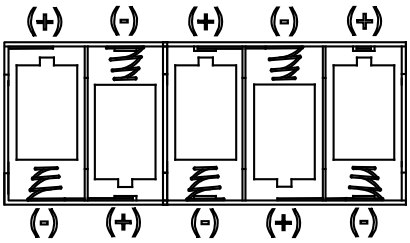
BLUETOOTH® TECHNOLOGY INTERFACE
• Utilizes either Port 1 or Port 2 Serial Output. RS232 serial Interface to Bluetooth Interface. Range 100 meters (328 feet). • The Bluetooth option will operate either as a Client or Server depending on which device the TS250 is connected. – If connected to a printer, the TS250 will be a **Server**. – If connected to a PC, the Instrument will be a **Client**.

1.5. BATTERY INSTALLATION

STAINLESS STEEL ENCLOSURE



ABS ENCLOSURE



Stainless Steel Instrument: Unscrew the black plastic end caps and insert 5 alkaline “D” cells as shown above.

ABS Instrument: Unscrew the two large knurled screws on the back of the Instrument and remove the battery cover. Insert 5 alkaline “D” cells as shown above.

Industrial "D" Size battery Energizer EN95 or equivalent is recommended for maximum operating time.

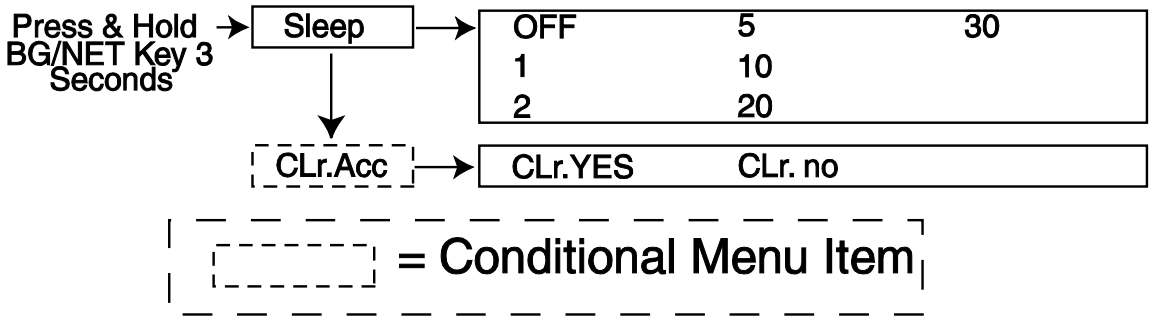
1.6. POWERING UP THE TS250

Press the ON / OFF Key for 1 to 2 seconds. The Instrument will display "**888888**" followed by a "**1234567890**" character display moving from right to left, followed by the revision of software. Upon completing the warm-up, the TS250 will display the actual weight on the scale.

To turn the TS250 off, press the **ON / OFF** key for 1 to 2 seconds.

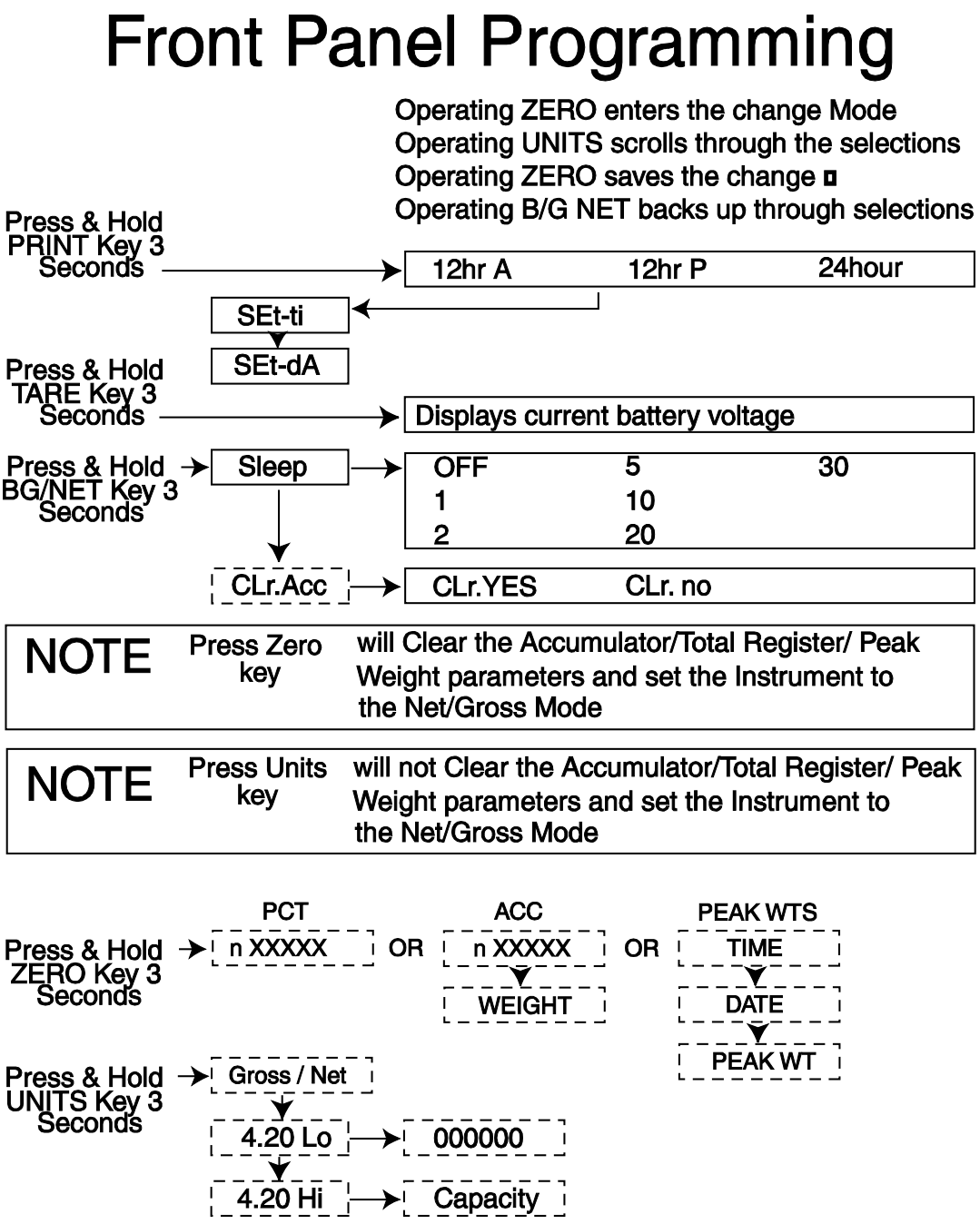
1.7. FLOW CHARTS

Dashed line boxes used in the flowchart indicate that the menu item availability is dependent upon programming performed elsewhere. For example, "clearing the accumulator" will not be available if accumulation has not been enabled.



Section 2: Front Panel Programming

2.1. FRONT PANEL PROGRAMMING PARAMETERS



2.2. FRONT PANEL PROGRAMMING

2.2.1. PROGRAMMING AND SETTING TIME

1. Press and hold the **PRINT** key for three (3) seconds.

Current Time Format will display:

- **12hr A –** 12 hour clock, currently AM.
- **12hr P –** 12 hour clock, currently PM.
- **24 hour –** Military time, (1:00 PM = 1300 hours).

2. Press the **ZERO** key to edit or **UNITS** key to skip.

- Press the **UNITS** key to toggle through the available selections.
- Press the **ZERO** key to enter the selection.

3. The display indicates **Set-ti,** and then shows the current time in **HHMMSS** format.

4. Press the **ZERO** key to edit or **UNITS** key to skip.

- The Hour digits will blink.
- Press **UNITS** key to increment to the **hour setting**.
- Press **ZERO** key.
- The Minutes digits will blink.
- Press **UNITS** key to increment to the **minutes setting.**
- Press **ZERO**.
- The Seconds digits will blink.
- Press **UNITS** to increment to the **seconds setting.**
- Press **ZERO** to enter the time settings.

5. When complete, Program will advance to programming the date.

2.2.2. PROGRAMMING THE DATE

1. **Set-dA** displays**,** followed by the current date setting in **MM-DD-YY** format.

2. Press the **ZERO** key to edit or **UNITS** key to skip.

- The Month digits will blink.
- Press **UNITS** key to increment to the desired month setting.
- Press the **ZERO** key to advance to the day setting.
- The Day digits will blink.
- Press **UNITS** key to increment to the desired day setting.
- Press the **ZERO** key to advance to the year setting.
- The Year digits will blink.

- Press **UNITS** key to increment to the desired year setting.
- Press the **ZERO** key to save the date setting.

3. When complete, the TS250 will return to the weight mode.

2.2.3. DISPLAY BATTERY VOLTAGE

1. Press and hold the **TARE** key for three (3) seconds.

- The battery current or power supply voltage displays – **8.3 VDC nominal**

2. When **TARE** key is released, the TS250 will return to the weight mode.

2.2.4. PROGRAMMING THE SLEEP FUNCTION

This function serves to prolong battery life by turning off the Instrument.

When there is no activity, the **Sleep Mode** activates according to the programmed time frame.

Activity is when weight is applied to the scale exceeding the motion band setting, pressing a key, or receiving a polling request on a communication port.

1. Press and hold the **BG/Net** key for three (3) seconds.

2. The display will indicate **SLEEP,** and then display the current setting.

- Settings in minutest include **OFF, 1, 2, 5, 10, 20, 30.**

3. Press the **ZERO** key to edit or **UNITS** key to skip.

- Press **UNITS** key to scroll through available settings.
- Press **ZERO** key to enter the selection.

4. When complete, the TS250 will return to the weight mode, if the Accumulator function is not active.

2.2.5. CLEARING THE ACCUMULATORS

The Accumulator(s) to be cleared depend on whether the **Operating Mode** is programmed to **Accumulation** or **Piece Count and Total**. (See Section 3.5. Operating Mode for details)

- Press and hold the **BG/Net** key for three (3) seconds.

- Press **UNITS** key until **CLr.ACC** displays on the Instrument.

1. Press the **ZERO** key to edit or **UNITS** key to skip.
   - Press **UNITS** key to toggle the available settings.
     - **Clr.YES** (**Clear the Accumulator**)
     - **CLr.NO** (**Do NOT Clear the Accumulator**)
   - Press the **ZERO** key to enter the selection.
2. When complete, the TS250 will return to the weight mode.

2.2.6. DISPLAY OPERATING MODE DATA

NOTE: *These options are conditional upon programming the* ***Operating Mode*** *(*See Section 3.5. Operating Mode for details

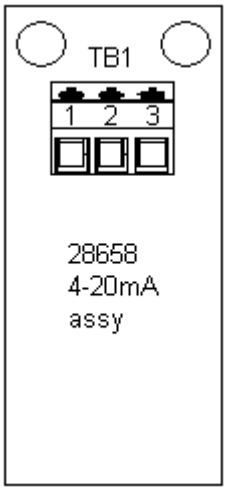
1. Press and hold the ZERO key for three (3) seconds.
2. Depending upon how the TS250 was programmed in the **Operating Mode,** one of these conditions will occur:

- **ACCUMULATION:**
  - The display will alternate between the number of Gross weight Accumulations **"n"** and the total Gross weight Accumulated for thirty (30) seconds, and then return to the **Weigh Mode**.
    - The caret (v) above the printed *Total Weight Accumulated* legend of the display will be seen.
  - Press the **B/G NET** key
    - The display will alternate between the number of Net weight Accumulations **"n"** and the total Net weight Accumulated for thirty (30) seconds, and then return to the **Weigh Mode**.
    - The caret (v) above the printed *Total Weight Accumulated* and *NET* legends of the display will be seen.
- **PIECE COUNT** or **PIECE COUNT AND TOTAL:**
  - After completing an initial piece sampling
    - When in the NET Weigh Mode (with container), the number of pieces "**n**" on the scale at the time the key is pressed will be displayed for 30 seconds.
    - When in the Gross Weigh Mode (without container), the number of pieces "**n**" on the scale at the time the key is pressed will be displayed for 30 seconds.
- **PEAK HOLD STABLE** or **PEAK HOLD UNSTABLE;** displays time, date, and peak weight, then times out to the Weigh Mode in thirty (30) seconds.

3. Pressing the **UNITS** key will skip time out and immediately exit to the Weigh Mode.

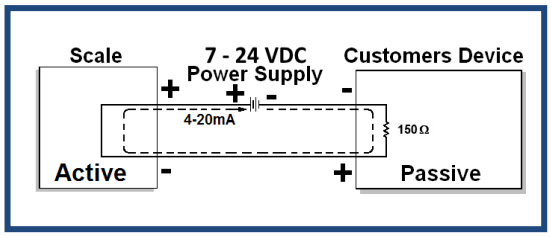
2.2.7. 4-20MA OUTPUT SETUP

The 4-20mA analog output is passive, so therefore it requires the receiving element to supply the loop with a dedicated, isolated power source from 7-24V DC. The output is linear throughout the range from 4mA to 20mA and can be programmed to increase (upweigh) or decrease (downweigh) as weight is increased.



Connections are as follows:

Pin 1	+ 4-20mA
Pin 2	– 4-20mA



2.2.8. PROGRAMMING THE 4-20MA ANALOG OUTPUT WEIGHING MODE

Setting up the **4-20mA Option** depends on how it is enabled and configured.

1. Press and hold **UNITS** for three (3) seconds.

2. **4-20** displays, followed by the current setting

- **GROSS** or **NET**.
- The 4-20mA analog output will track the selection.
- It will continue to track the selection regardless of the active weight display mode of the TS250.

3. Press the **ZERO** key to edit or **UNITS** key to skip.
- Press the **UNITS** key to toggle the available settings.
- Press **ZERO** to enter the selection.

4. When complete, Program will advance to programming the 4-20mA 4mA setting.

2.2.9. PROGRAMMING THE 4MA WEIGHT VALUE

1. **4.20 Lo** displays, followed by the current setting.

2. Press the **ZERO** key to edit, or press the **UNITS** key to skip.

a. The most significant digit will be blinking, operate the **UNITS** key to increment the number.
b. When the desired value has been obtained, Press the **ZERO** key.
c. The next less significant digit will then blink, operate the **UNITS** key to increment the number.
d. Repeat steps b and c until the least significant digit has been completed.
This weight value will result in a **4mA Output**.

3. When complete, the program will advance to the 20mA menu.

2.2.10. PROGRAMMING THE 20MA WEIGHT VALUE

1. **4.20 Hi** displays, followed by the current setting.

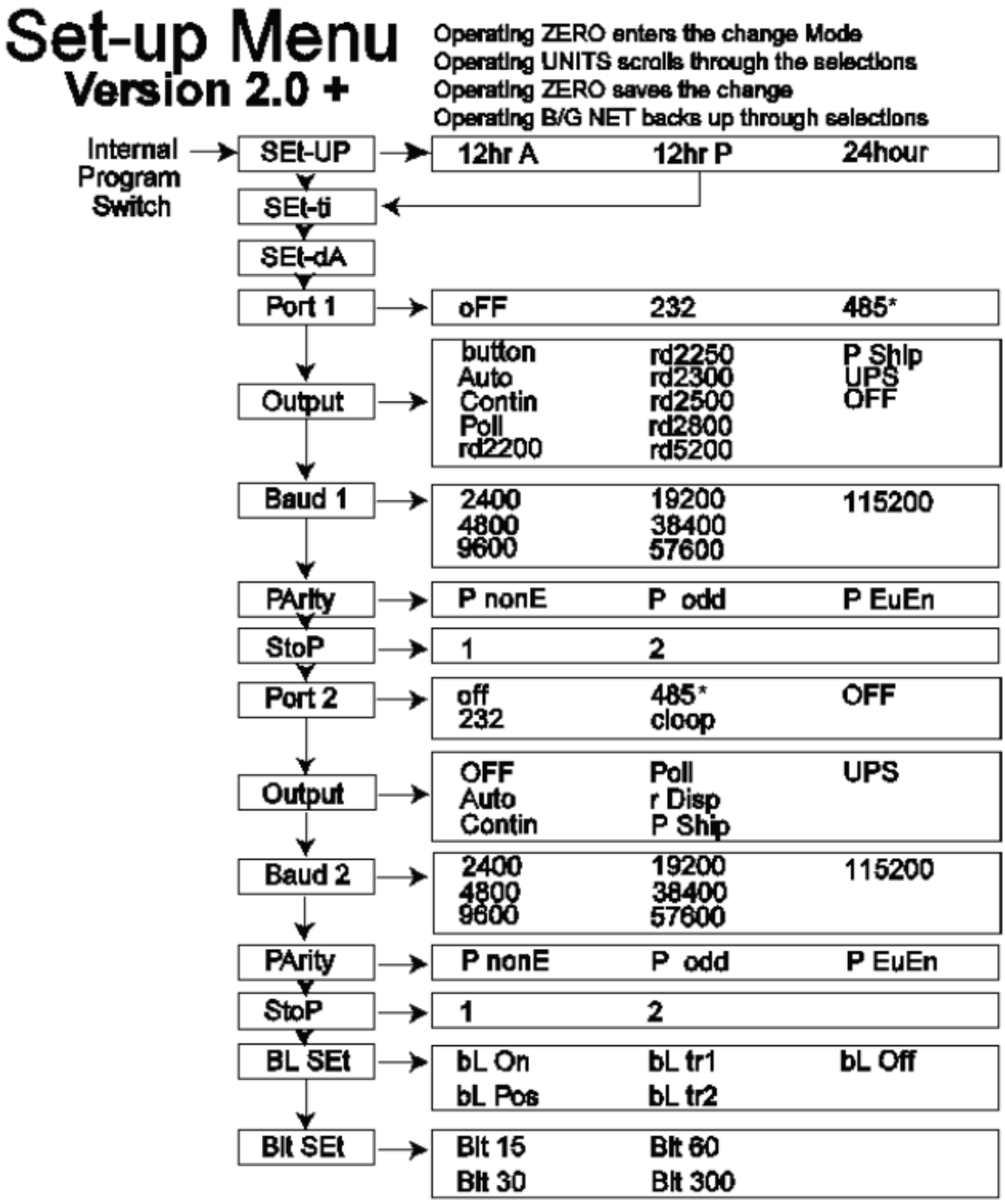
2. Press the **ZERO** key to edit, or press the **UNITS** key to skip.

a. The most significant digit will be blinking, operate the **UNITS** key to increment the number.
b. When the desired value has been obtained, Press the **ZERO** key.
c. The next less significant digit will then blink, operate the **UNITS** key to increment the number.
d. Repeat steps b and c until the least significant digit has been completed.
This weight value will result in a **20mA Output**

3. When complete, the TS250 will return to weigh mode.

Section 3: Operation

3.1. SETUP MENU PROGRAMMING PARAMETERS – VERSION 2.0+



* RS485 is selected when RS422 output is required. Reference wiring and jumper connections in **Section 5: Serial Communication Wiring**.

3.2. SETUP MENU PROGRAMMING

1. Press the **INTERNAL PROGRAM SWITCH** until **Setup** displays.

2. Press the **UNITS** key.

3.2.1. PROGRAMMING AND SETTING TIME

1. The current display format setting will display

   - **12hr A –** 12 hour clock, currently AM.
   - **12hr P –** 12 hour clock, currently PM.
   - **24 hour –** Military time (1:00 PM = 1300 hours).

2. Press the **ZERO** key to edit or **UNITS** key to skip.

   - Press the **UNITS** key to toggle through the available selections.
   - Press the **ZERO** key to save the selection.

3. **Set-ti** displays, followed by the current time setting in **HHMMSS** format.

4. Press the **ZERO** key to edit or **UNITS** key to skip.

   - The Hour digits will blink.
   - Press **UNITS** key to increment to the **hour setting**.
   - Press **ZERO** key.
   - The Minutes digits will blink.
   - Press **UNITS** key to increment to the **minutes setting.**
   - Press **ZERO**.
   - The Seconds digits will blink.
   - Press **UNITS** to increment to the **seconds setting.**
   - Press **ZERO** to enter the time settings.

5. When complete, the program will advance to Programming the Date.

3.2.2. PROGRAMMING THE DATE

1. **Set-dA** displays**,** followed by the current date setting in **MM-DD-YY** format.

2. Press the **ZERO** key to edit or **UNITS** key to skip.

   - The Month digits will blink.
   - Press **UNITS** key to increment to the desired month setting.
   - Press the **ZERO** key to advance to the day setting.
   - The Day digits will blink.
   - Press **UNITS** key to increment to the desired day setting.
   - Press the **ZERO** key to advance to the year setting.
   - The Year digits will blink.
   - Press **UNITS** key to increment to the desired year setting.
   - Press the **ZERO** key to save the date setting.

3. When complete, the program will advance to Port 1.

NOTE: See Section 5.2: TB4 CONNECTIONS, COM1 (A), COM2 (B), AND COM2 (C).

3.2.3. PROGRAMMING PORT 1

1. **Port 1** displays, followed by the current protocol setting.

- OFF – com port is not active.
- rS232 – using RS232 protocol
- rS485 – using RS485 or RS422 protocol

2. Press **ZERO** key to edit, or **UNITS** key to skip.

- Press the **UNITS** key to scroll through available settings.
- Press **ZERO** to select an option.

3. When complete, the program will advance to Port 1output.

3.2.4. PROGRAMMING THE PORT 1 OUTPUT TYPE

1. **Output** displays, followed by the current output type setting:
   - **Button -**Using the Print key.
   - **Auto-** Activated by stable weight above 10d, reset by return to half of printed weight.
   - **Contin -**Continuous Output. Once every display update rate.
   - **Poll -**Demand Output by receipt of CR or programmed poll character
   - **Rd2200 -**Remote Display for Fairbanks 2200
   - **Rd2250 -**Remote Display for TS250/55
   - **Rd2300 -**Remote Display for IT-2000
   - **Rd2500 -**Remote Display for IS-3000
   - **Rd2800 -**Remote Display for Fairbanks 2800
   - **Rd5200 -**Remote Display for Fairbanks 5200
   - **P Ship -**Used for FedEx Shipping Software
   - **UPS -**Used for UPS Shipping Software
   - **OFF -**Output is not active

2. Press **ZERO** key to edit, or **UNITS** key to skip.

- Press the **UNITS** key to scroll through available settings.
- Press **ZERO** to select an option.

3. When complete, the program will advance to Port 1 Baud Rate.

3.2.5. PROGRAMMING PORT 1 BAUD RATE

1. **Baud 1** displays, followed by the current baud rate setting.

- 2400
- 4800
- 9600
- 19200
- 38400
- 57600
- 115200

2. Press **ZERO** key to edit, or **UNITS** key to skip.

- Press the **UNITS** key to scroll through available settings.
- Press **ZERO** key to select an option.

3. When complete, the program will advance to Port 1 Data Bits.

3.2.6. PROGRAMMING PORT 1 DATA BITS

1. **d-bitS** displays, followed by the current data bits setting:

- 8
- 7

2. Press **ZERO** key to edit, or **UNITS** key to skip.

- Press the **UNITS** key to scroll through available settings.
- Press **ZERO** key to select an option.

3. When complete, the program will advance to Port 1 Parity Setting.

3.2.7. PROGRAMMING PORT 1 PARITY SETTING

1. **Parity** displays, followed by the current parity bit setting:

- **P None** – no parity bit
- **P Odd** - odd parity bit
- **P Even** – even parity bit

2. Press **ZERO** key to edit, or **UNITS** key to skip.

- Press the **UNITS** key to scroll through available settings.
- Press **ZERO** key to select an option.

3. When complete, the program will advance to Port 1 stop bits.

3.2.8. PROGRAMMING PORT 1 STOP BITS

1. **Stop** displays, followed by the current stop bits setting:

   - 1
   - 2

2. Press **ZERO** key to edit, or **UNITS** key to skip.

   - Press the **UNITS** key to scroll through available settings.
   - Press **ZERO** key to select an option.

3. When complete, the program will advance to Port 2.

3.2.9. PROGRAMMING PORT 2

1. **Port 2** displays, followed by the current protocol setting:

   - **OFF –** com port is not active
   - **rS232 -** Using RS232 protocol
   - **rS485 -** Using RS485 or RS422 protocol
   - **Cloop** Using 20mA Current Loop (passive)

2. Press **ZERO** key to edit, or **UNITS** key to skip.

   - Press the **UNITS** key to scroll through available settings.
   - Press **ZERO** key to select an option.

3. When complete, the program will advance to Port 2 Output.

3.2.10. PROGRAMMING THE PORT 2 OUTPUT TYPE

1. **Output** displays, followed by the current output type setting:

   - **Auto -** Activated by stable weight above 10d, reset by return to half of printed weight.
   - **Contin -** Continuous Output. Once every display update rate.
   - **Poll -** Demand Output by receipt of CR from external source.
   - **r Disp –** 218 Series Remote Display output format
   - **P Ship -** Used for Fed Ex Shipping Software
   - **UPS -** Used for UPS Shipping Software
   - **OFF -** output is not active.

2. Press **ZERO** key to edit, or **UNITS** key to skip.

   - Press the **UNITS** key to scroll through available settings.
   - Press **ZERO** key to select an option.

3. When complete, the program will advance to Port 2 baud rate.

3.2.11. PROGRAMMING PORT 2 BAUD RATE

1. **Baud 2** displays, followed by the current baud rate setting.

- 2400
- 4800
- 9600
- 19200
- 38400
- 57600
- 115200

2. Press **ZERO** key to edit, or **UNITS** key to skip.

- Press the **UNITS** key to scroll through available settings.
- Press **ZERO** key to select an option.

3. When complete, the program will advance to Port 2 Data Bits.

3.2.12. PROGRAMMING PORT 2 DATA BITS

1. **d-bitS** displays, followed by the current data bits setting:

- 8
- 7

2. Press **ZERO** key to edit, or **UNITS** key to skip.

- Press the **UNITS** key to scroll through available settings.
- Press **ZERO** key to select an option.

3. When complete, the program will advance to Port 2 Parity Setting.

3.2.13. PROGRAMMING PORT 2 PARITY SETTING

1. **Parity** displays, followed by the current parity bit setting:

- **P None** – no parity bit
- **P Odd** – odd parity bit
- **P Even** – even parity bit

2. Press **ZERO** key to edit, or **UNITS** key to skip.

- Press the **UNITS** key to scroll through available settings.
- Press **ZERO** key to select an option.

3. When complete, the program will advance to Port 2 stop bits.

3.2.14. PROGRAMMING PORT 2 STOP BITS

1. **Stop** displays, followed by the current stop bits setting:

- 1
- 2

2. Press **ZERO** key to edit, or **UNITS** key to skip.

- Press the **UNITS** key to scroll through available settings.
- Press **ZERO** key to select an option.

3. When complete, the program will advance to Back light options.

3.2.15. PROGRAMMING THE BACK LIGHT OPTIONS

1. The current setting displays:

- **bL On -** Back light always **ON**.
- **bL POS -** Back light only on with a positive weight on the scale, otherwise off.
- **bL tr1 -** Back light **ON** with a positive weight on the scale until weight has been stable for the amount of time selected at the following program step.
- **bL tr2 -** Back light **ON** with a positive weight until returned to zero and stable for the amount of time selected at the following program step.
- **bL OFF -** Back light always **OFF**.

2. Press **ZERO** key to edit, or **UNITS** key to skip.

- Press the **UNITS** key to scroll through available settings.
- Press **ZERO** key to select an option.

3. When complete, the program will advance to Back light timing.

3.2.16. PROGRAMMING THE BACK LIGHT TIMING

1. The current setting displays:

- **bLt 15 -** back light remains illuminated 15 seconds
- **bLt 30 -** back light remains illuminated 30 seconds
- **bLt 60 -** back light remains illuminated 60 seconds
- **bLt 300 -** back light remains illuminated 300 seconds

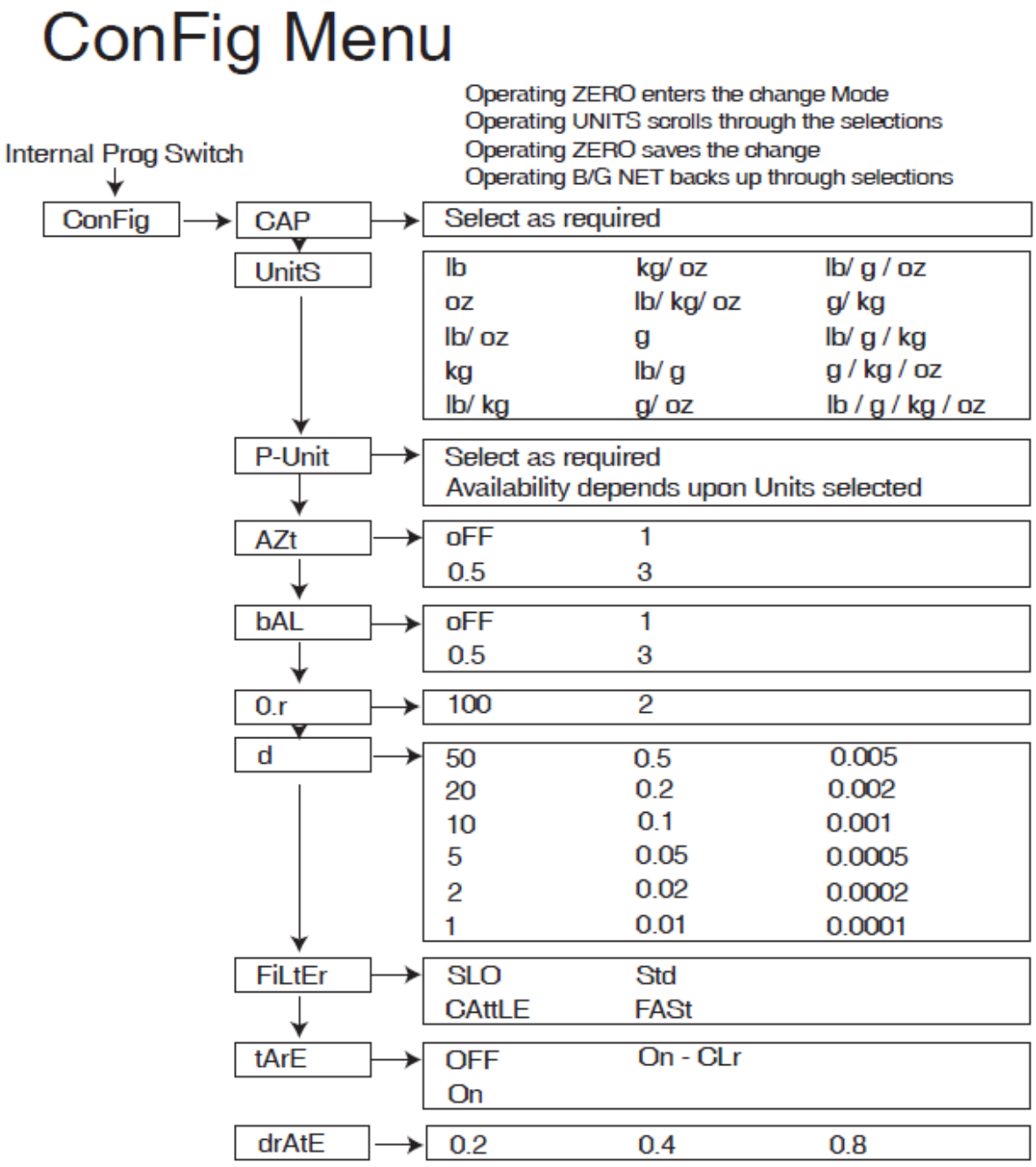
2. Press **ZERO** key to edit, or **UNITS** key to skip.

- Press the **UNITS** key to scroll through available settings.

- Press **ZERO** key to select an option.

3. When complete, the program will advance to Configuration Menu.

3.3. CONFIGURATION MENU PROGRAMMING PARAMETERS



1. Press the **INTERNAL PROGRAM SWITCH** until **ConFig** is displayed.

2. Press the **UNITS** key.

3.3.1. PROGRAMMING THE SCALE CAPACITY

1. **CAP** displays, followed by the current scale capacity setting with a caret symbol (**v**) located above the printed unit legend of the display representing the current primary unit setting.

2. Press **ZERO** key to edit, or **UNITS** key to skip.

   - Most significant digit will blink
   - Press **UNITS** key to scroll through available settings.
   - Press **ZERO** key to enter and advance to next digit
   - Repeat the process until the least significant digit is selected.

3. When complete, the program will advance to scale units.

NOTE: *Capacity can be up to six (6) displayed digits* ***(i.e. 999999).*** *All six digits must be entered to advance to the next parameter.*

3.3.2. PROGRAMMING THE SCALE UNITS

1. **UnitS** displays, and the current setting with a caret symbol (**v**) above the printed unit(s) legend of the display.

2. Press **ZERO** key to edit, or **UNITS** key to skip.

   - Press the **UNITS** key to scroll through available settings.
   - The caret will automatically move to the choices.
   - Available selections include any single or combinations of:
   - lb - pounds
   - kg - kilograms
   - oz - ounces
   - g - grams
   - Press **ZERO** key to save the selection.

3. When complete, the program will advance to programming primary unit.

NOTE:

1. **lb-oz** *and* **custom** *units are also available, but can only be programmed with the PC25X software utility (see Section 7.)*
2. *The* **lb-oz** *and* **custom unit** *settings cannot be used as the* **Primary Unit** *in the TS250.* ***They are not legal for trade****.*
3. *When using* **lb-oz***, the TS250 must be calibrated in* **lb** *or* **oz,** *and not* **lb-oz.**
4. *When programming for* **lb-oz***, the division size must be 0.2 or smaller; 0.5 or higher will not convert to lbs/oz, the instrument will display dashes.*
5. *When* **lb-oz** *units are active, both the lb and oz caret symbols are on.*
6. *When* **custom** *units are active, all caret symbols are off.*

3.3.3. PROGRAMMING THE PRIMARY UNIT

This option sets up the **Unit** parameter for scale capacity, calibration, and the default unit when the instrument is powered up.

1. **P-Unit** displays, and the current Primary Unit setting with a caret symbol (v) above the printed unit legend of the display.

2. Press **ZERO** key to edit, or **UNITS** key to skip.

- Press the **UNITS** key to scroll through available settings.
- The caret will automatically move to the choices.
- Available selections include:
- lb - pounds
- kg - kilograms
- oz - ounces
- g - grams
- Press **ZERO** key to save the selection.

3. When complete, the program will advance to programming AZT.

3.3.4. PROGRAMMING THE AUTOMATIC ZERO TRACKING BAND

This option maintains **ZERO** when small amounts of material are placed on the scale, such as rain, snow, debris, etc.

1. The current AZT setting displays:

- **AZt .off –** function is not active.
- **AZt 0.5 -** Half of a division / increment / graduation
- **AZt 1 -** One division / increment / graduation
- **AZt 3 -** Three divisions / increments / graduations

2. Press **ZERO** key to edit, or **UNITS** key to skip.

- Press the **UNITS** key to scroll through available settings.
- Press **ZERO** key to select an option.

3. When complete, the program will advance to programming the Motion Band.

3.3.5. PROGRAMMING THE MOTION BAND

This option defines the range that weight must be stable before the scale can be zeroed and the print function can generate a ticket.

1. The current motion band setting displays:

- **bAL .off –** function is not active.
- **bAL 0.5 -** Half of a division / increment / graduation
- **bAL 1 -** One division / increment / graduation
- **bAL 3 -** Three divisions / increments / graduations

2. Press **ZERO** key to edit, or **UNITS** key to skip.

- Press the **UNITS** key to scroll through available settings.
- Press **ZERO** key to select an option.

3. When complete, the program will advance to programming the Motion Band.

3.3.6. PROGRAMMING THE ZERO RANGE

This option defines the percentage of scale capacity that can be “zeroed” off by pressing the **ZERO Key**.

1. The current zero range setting displays:

- **O.r 100 -** One hundred percent (100%) zero range
- **O.r 2 -** Two percent (2%) zero range
- **Disabl** - Disables the **ZERO** key.

2. Press **ZERO** key to edit, or **UNITS** key to skip.

- Press the **UNITS** key to scroll through available settings.
- Press **ZERO** key to select an option.

3. When complete, the program will advance to programming the Division Size.

3.3.7. PROGRAMMING THE DIVISION SIZE

1. The current division size setting displays:

   d X, where **X** is one of the following:

- 50
- 20
- 10
- 5
- 2
- 1
- 0.5
- 0.2
- 0.1
- 0.05
- 0.02
- 0.01
- 0.005
- 0.002
- 0.001
- 0.0005
- 0.0002
- 0.0001

2. Press **ZERO** key to edit, or **UNITS** key to skip.

   - Press the **UNITS** key to scroll through available settings.
   - Press **ZERO** key to select an option.

3. When complete, the program will advance to programming the Division Size.

3.3.8. PROGRAMMING THE FILTER SETTING

This option compensates for the effects of motion, vibration, and wind currents.

1. **FiLtEr** displays, followed by the current filter setting:

   - **SLO -** Heavy filtering
   - **Cattle -** Very heavy filtering
   - **Stand -** Medium filtering
   - **FASt -** Light filtering

2. Press **ZERO** key to edit, or **UNITS** key to skip.

   - Press the **UNITS** key to scroll through available settings.
   - Press **ZERO** key to select an option.

3. When complete, the program will advance to programming the Tare setting.

3.3.9. PROGRAMMING THE TARE SETTING

This option determines whether the instrument will display the product's **Net Weight**, without the container's weight.

1. **tArE** displays, followed by the current **Tare** setting:

   - **OFF -** Tare is disabled.
   - **ON -** Tare is active.
   - **On-CLr -** Tare automatically clears when Gross Weight returns to ZERO.

2. Press **ZERO** key to edit, or **UNITS** key to skip.

   - Press the **UNITS** key to scroll through available settings.
   - Press **ZERO** key to select an option.

3. When complete, the program will advance to programming the display update rate.

3.3.10. PROGRAMMING THE DISPLAY UPDATE RATE

This option sets the allotted time between **Display Updates**.

1. **drAtE** displays, followed by the current update rate setting:

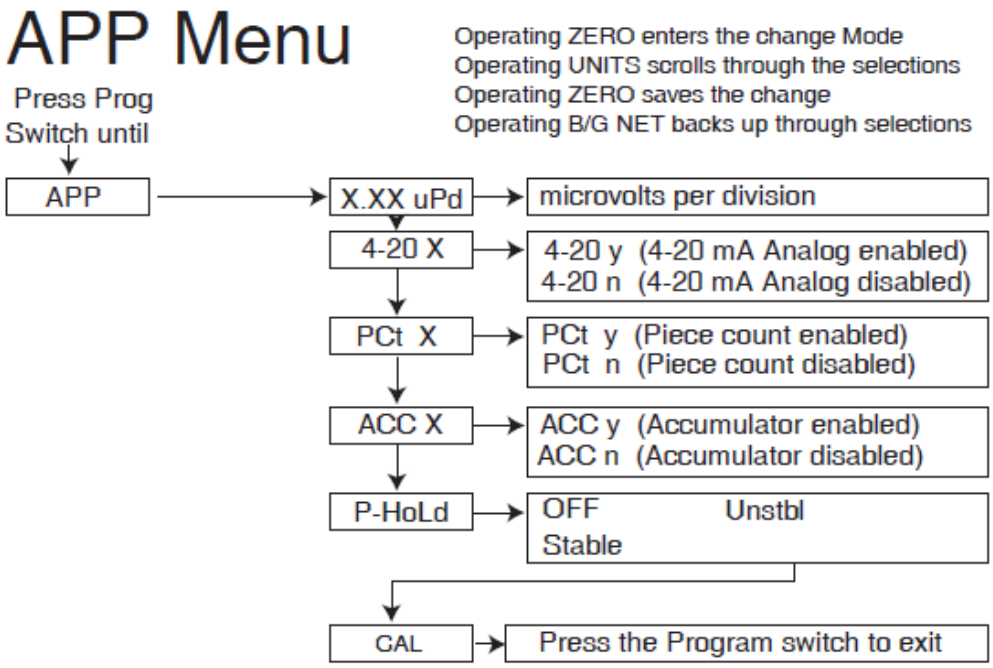
   - **0.2** - 200 milliseconds
   - **0.4** - 400 milliseconds
   - **0.8** - 800 milliseconds

2. Press **ZERO** key to edit, or **UNITS** key to skip.

   - Press the **UNITS** key to scroll through available settings.
   - Press **ZERO** key to select an option.

3. When complete, the program will advance to the Application Menu.

3.4. APPLICATION MENU PROGRAMMING PARAMETERS



1. Press the **Internal Program Switch** until **APP** displays.

2. Press **UNITS** key.

3.4.1. MICROVOLTS PER DIVISION

X.XX uPd displays where X.XX is the current **microvolts per division** for the TS250.

3.4.2. PROGRAMMING THE 4-20MA ANALOG OUTPUT

1. The current 4-20mA setting displays:

   - **4-20 n –** front panel access is disabled while the analog output continues to operate.
   - **4-20 Y –** front panel access is active while the analog output continues to operate.

2. Press **ZERO** key to edit, or **UNITS** key to skip.

   - Press the **UNITS** key to scroll through available settings.
   - Press **ZERO** key to select an option.

3. When complete, the program will advance to programming piece count.

** See Section 2 for Front Panel Programming details*

3.4.3. PROGRAMMING THE PIECE COUNT FEATURE

1. The current piece count setting displays:

- **PCt n –** feature is disabled (NO)
- **PCt Y –** feature is active (YES)

2. Press **ZERO** key to edit, or **UNITS** key to skip.

- Press the **UNITS** key to scroll through available settings.
- Press **ZERO** key to select an option.

3. When complete, the program will advance to programming the accumulator.

NOTE*:* See **Sections 3.5.11 – 3.5.14** for user operations of this feature.

3.4.4. PROGRAMMING THE ACCUMULATOR FEATURE

1. The current accumulator setting displays:

- **ACC n –** feature is disabled (NO)
- **ACC Y –** feature is active (YES)

2. Press **ZERO** key to edit, or **UNITS** key to skip.

- Press the **UNITS** key to scroll through available settings.
- Press **ZERO** key to select an option.

3. When complete, the program will advance to programming the peak hold.

NOTE*:* See **Sections 3.5.8 – 3.5.10** for user operations of this feature.

3.4.5. PROGRAMMING THE PEAK HOLD FEATURE

1. **P-Hold** displays, followed by the current peak hold setting:

- **OFF** - feature is disabled.
- **StAbLE** – peak hold when weight is stable
- **UnStbL** – peak hold even when weight is unstable.

2. Press **ZERO** key to edit, or **UNITS** key to skip.

- Press the **UNITS** key to scroll through available settings.
- Press **ZERO** key to select an option.

3. When complete, the program will advance to the calibration menu.

NOTE*:* See **Section 3.5.16** for user operation of this feature.

3.4.6. PROGRAMMING THE MONORAIL FEATURE

1. **rAil** displays, followed by the current monorail setting:

- rAiL n – feature is disable
- rAiL Y – feature is enabled

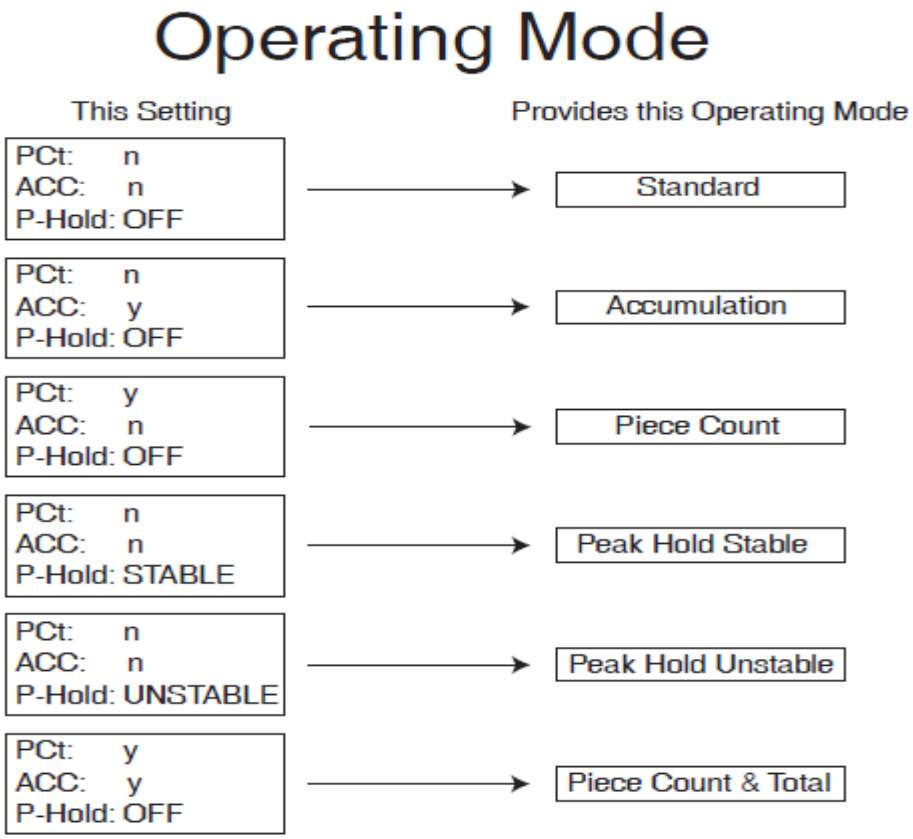
2. Press **MENU** key to edit, or the **RIGHT ARROW KEY** to skip.

- Use the **RIGHT ARROW KEY** to scroll through available settings.
- Press **ENTER** to select the displayed option.

3. When complete, the program will advance to the calibration menu

NOTE: See **section 3.5.18** for user operation of this feature. **rAiL** parameter is only available via the instrument menu (not with the PC225X utility).

3.5. OPERATING MODE



NOTE: See **Section 3.5.** Operating Mode.

3.5.1. FRONT PANEL KEY FUNCTIONS

ON/OFF	Turns the Instrument on or off.
UNITS	Switches between pre-programmed selectable weight units.
ZERO	Sets the display to zero, programmable: 2% or 100% of capacity.
B/G – NET	Toggles between Gross and Net weights • This apples only if a Tare Value has been entered greater than ZERO.
TARE	Automatically tares off displayed weight when key is pressed.
PRINT	Simple RS232 output when key is pressed.

Depending on programmed selection, **Tare Weight** *will do one of the following.*

- Be retained for reuse until changed, or if power is removed.

OR…

- Automatically clear when **Gross Weight** returns to **ZERO**.

3.5.2. OPERATING PROCEDURES

Press the **ON / OFF** Key for one to two (1 – 2) seconds. The Instrument will display "**888888**" followed by a "**1234567890**" character display moving from right to left, followed by the revision of software. Upon completing the warm-up, the TS250 will either display zero, or it will display the actual weight on the scale.

The **Zero** function, Tare function, and **AZT** require the displayed weight to be stable before these functions will operate. The weight reading is stable if the variation in weight is less than the programmed bAL range.

3.5.3. INSTRUMENT WEIGHING FUNCTIONS

The industry uses three terms to describe the apportionment of an object's weight. These terms are GROSS WEIGHT, TARE WEIGHT, and NET WEIGHT.

Example: A can of house paint is an object to be weighed.
The empty can is the 'TARE' weight,
the paint is the 'NET' weight, and
together they equal the 'GROSS' weight.

GROSS = NET + TARE
GROSS – NET = TARE
GROSS – TARE = NET

3.5.4. Basic Weighing

Ensure platform is empty, turn the scale ON, press the ZERO key and the display indicates "0" and is ready for use.

3.5.5. GROSS WEIGHING

Follow these steps for **Gross Weighing**.

1. Unload the Scale.
2. Press the **ZERO** key, if required, to set scale to "0".
3. Place container/object on scale.
4. Read the **Gross Weight** on the display.

3.5.6. NET WEIGHING WITH AUTOTARE

Follow these steps for **Net Weighing**.

1. Unload the Scale.
2. Press the **ZERO** key, if required, to set scale to "0".
3. Place container/object on scale (Tare weight).
4. Press the **TARE** key.
5. Place material in container or add objects (Net weight).

6. Read the **Net Weight** on the display. The caret (v) above the printed NET legend of the display will be seen.

3.5.7. NET WEIGHING WITH MANUAL TARE ENTRY

1. Place container/object on scale.
2. From the Gross Weighing Mode, key in the desired tare weight using the 0-9 keys.
3. Press the **Enter** key.
4. The instrument changes to the Net Weighing Mode (Note: the caret (v) above the printed NET legend of the display will be seen.)

   The net weight displays
5. Press the **GROSS/NET** key to toggle back and forth between **Gross** and **Net** weight.

3.5.8. WEIGHT ACCUMULATION

Note: To activate Accumulation manually, please see the 2250 Service Manual (#51213), or it can be activated using the PC225X utility.

3.5.9. GROSS WEIGHT ACCUMULATION

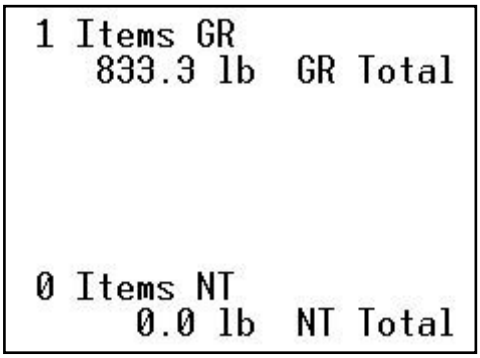
1. Unload the Scale.
2. Press the **ZERO** key, if required, to set scale to **“0”.**
3. Place a weight on the Scale Platform.
4. After the weight is stable, press the **B/G NET** key. The display alternates between the number of Accumulations **"n"** and the total Gross weight Accumulated.

   – The caret (v) above the printed *Total Weight Accumulated* legend of the display will be seen.
5. Press the **UNITS** key to accept the weight, display will momentarily indicate “**ACCEPt**”, and return to the weigh screen.

OR

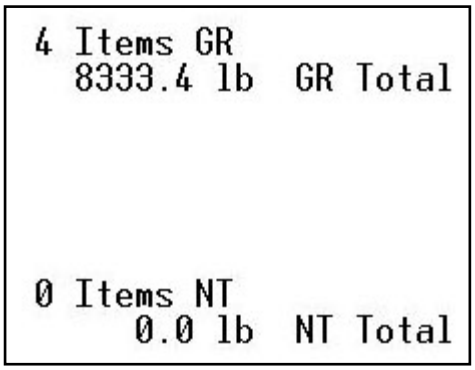
Press the **B/G NET** key to skip and return to the weigh screen.

At this point pressing the Print key will output the following, assuming you have CNT GR, CNT NT, GR Acc and NT ACC enabled to print: (See Section 7.7: First time connection using the PC225X PC Utility and FB225X Ethernet TCP/IP option for further instructions).



6. The scale must return to **"0" Gross Mode** before another accumulation can occur.
7. Repeat steps 3 through 6 for additional accumulations.

   Here you see a sample ticket with 4 gross accumulations stored.



3.5.10. NET WEIGHT ACCUMULATION

1. Unload the Scale.
2. Press the **ZERO** key, if required, to set scale to **"0".**
3. Place container/object on scale.
4. Press the **TARE** key.
5. Place material in container or add objects.

6. After the weight is stable, press the **B/G NET** key. The display alternates between the number of Accumulations **"n"** and the total Net weight Accumulated.

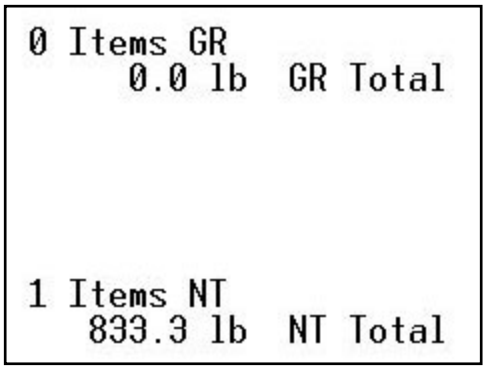
   – The caret (v) above the printed *Total Weight Accumulated* and *NET* legends of the display will be seen.

7. Press the **UNITS** key to accept the weight, display will momentarily indicate "**ACCEPt**" and will return to the weigh screen.

   OR

   Press the **B/G NET** key to skip and return to the weigh screen.

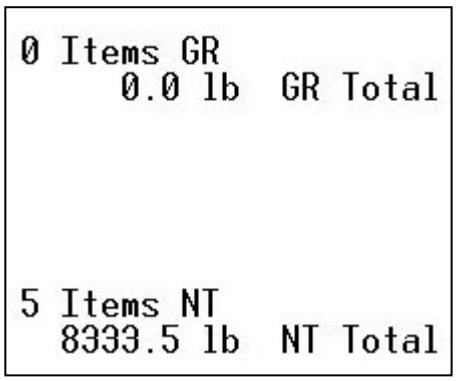
   At this point pressing the Print key will output the following, assuming you have CNT GR, CNT NT, GR Acc and NT ACC enabled to print: (See Section 7.7: First time connection using the PC225X PC Utility and FB225X Ethernet TCP/IP option for further instructions).



8. The scale must return to **"0" Gross Mode** before another accumulation can occur.

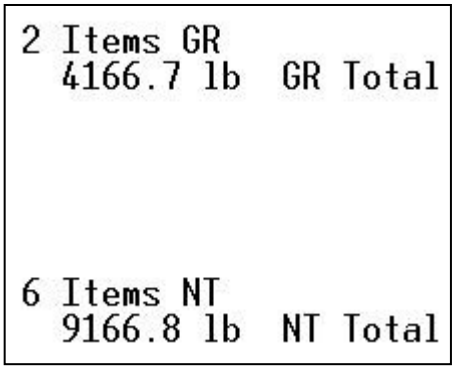
9. Repeat steps 3 through 8 for additional accumulations.

   Here you see a sample ticket with 5 NET accumulations stored. Note that the Tare weight is not shown.



3.5.11. GROSS AND NET WEIGHT ACCUMULATIONS

Gross weight and NET weight can be accumulated simultaneously in the TS250. Each Gross weight stored will be in its own register and each NET weight stored will be in its own register, completely independent from each other.



3.5.12. NUMBER OF ACCUMULATIONS

1. Press and hold the **ZERO** key for three (3) seconds.
   - The display will alternate between the number of Gross weight Accumulations **"n"** and the total Gross weight Accumulated for thirty (30) seconds, then return to the **Weigh Mode**.
   - The caret (v) above the printed *Total Weight Accumulated* legend of the display will be seen.

2. Press the **B/G NET** key
   - The display will alternate between the number of Net weight Accumulations **"n"** and the total Net weight Accumulated for thirty (30) seconds, then return to the **Weigh Mode**.
   - The caret (v) above the printed *Total Weight Accumulated* and *NET* legends of the display will be seen.

3. Press the **B/G NET** key to alternate between Gross and Net accumulations or press the **UNITS** key at any time to exit immediately to the **Weigh Mode**.

3.5.13. CLEARING THE ACCUMULATORS

- Press and hold the **BG/Net** key for three (3) seconds.
- Press **UNITS** key until **CLr.ACC** displays on the Instrument.

1. Press the **ZERO** key to edit or **UNITS** key to skip.f
   - Press **UNITS** key to toggle the available settings.
     - **Clr.YES** (Clear the Accumulator)
     - **CLr.NO** (Do NOT Clear the Accumulator)

- Press the **ZERO** key to enter the selection.

2. When complete, the TS250 will return to the weight mode.

3.5.14. PIECE COUNTING

NOTE: For the following operation to function:

The Piece Count parameter “PCt” must be set to “Y” (See Section 3.4.3. Programming the Piece Count Feature, the Accumulator parameter “ACC” must be set to “n” (See Section 3.4.3. Programming the Piece Count Feature) and the Peak Hold parameter “P-Hold” must be set to “n”

1. Unload the Scale
2. Press the **ZERO** key, if required, to set scale to **“0”.**
3. Place the empty weighing container on the Scale Platform.
4. Press the **TARE** key**.**
   - This stores the container weight only, placing the scale in the **Net Mode**.
   - **“0”** should display on the instrument and the caret (v) above the printed NET legend of the display will be seen.
5. Press the **B/G NET** key.
   - – The Display prompts to "**Add 1**" number of sample parts to the container.
6. Pressing the **B/G NET** key repeatedly will prompt the user to;

   "**Add 1**", "**Add 5**", "**Add 10**", "**Add 25**", **Add 50**", or "**Add 100**" sample pieces.
7. Add the required sample pieces to the container, then press the **UNITS** key.
   - The Display will alternate between indicating the net weight and the number of sample pieces.
8. Continue to add the remaining pieces to the container.
   - The display will update and continue to alternate between the net **Weight** and **Number of Pieces**, including the original sample.
9. To Exit to the NET Weigh Mode, press the **B/G NET** key.

3.5.15. PIECE COUNT AND TOTAL

NOTE: For the following operation to function:

- The Piece Count parameter “PCt” must be set to “Y” (See Section 3.4.3.), the Accumulator parameter “ACC” must be set to “Y” (See Section 3.4.4.) and the Peak Hold parameter “P-Hold” must be set to “n” (See Section 3.4.5.)

This feature enables the TS250 to display the Count and **Net Weight** of the counted items, and to display the Total Count of accumulated items.

1. Unload the Scale.
2. Press the **ZERO** key, if required, to set scale to **“0”.**

3. Place the empty weighing container on the Scale Platform.

4. Press the **TARE** key.

   - – This stores the container weight only, placing the scale in the **Net Mode**.
   - – **“0”** should display on the instrument and the caret (v) above the printed NET legend of the display will be seen.

5. Press the **B/G NET** key.

   - The Display prompts to "**Add 1**" number of sample parts to the container.

6. Pressing the **B/G NET** key repeatedly will prompt the user to;

   "**Add 1**", "**Add 5**", "**Add 10**", "**Add 25**", **Add 50**", or "**Add 100**" sample pieces.

7. Add the required sample to the container, then press the **UNITS** key.

   - The Display alternates between indicating the net weight and the number of sample pieces.

8. Continue to add the remaining pieces to the container.

   - The display will update and continue to alternate between the net **Weight** and **Number of Pieces**, including the original sample.

9. Press the **B/G NET** key.

   - The Display will alternate between the **"Total"** legend and the total **Number of Pieces Accumulated** plus the current **number of pieces**.
   - Press the **B/G NET** key to return to step 6.

10. Press the **UNITS** key to save the new Total in the accumulator and return to the NET **Weigh Mode**.

    - To continue adding to the Total, repeat steps 1-10.
    - To reset the Total see “Clearing the Accumulators” (Section 3.5.10)

3.5.16. PEAK WEIGHT

NOTE: For the following operation to function:

- The Piece Count parameter “PCt” must be set to “Y” (See Section 3.4.3.), the Accumulator parameter “ACC” must be set to “Y” (See Section 3.4.4.) and the Peak Hold parameter “P-Hold” must be set to “n” (See Section 3.4.5.)

The **Peak Weight** feature records the heaviest stable or unstable load placed on the scale, and the time and date it occurred. To display the current Peak Weight perform the following:

1. Press and hold the **ZERO** key for three (3) seconds.

- The display will show the **time** and then alternate between the **date** and **Peak Weight Value**, for thirty (30) seconds, then return to the **Weigh Mode**.

2. Press the **UNITS** key to end the process and immediately exit to the **Weigh Mode**.

- To reset the Peak Weight value, see Section 3.5.13 Clearing the Accumulators.

3.5.17. DISPLAY TOTAL NUMBER OF PIECES

Press the Zero key for 3 seconds

Conditional upon programming the operating mode to accumulation, piece count, or piece count and total.

The TS250 will display total number of pieces, weight, and time out (30 sec).

Conditional upon programming the operating mode to peak hold stable or peak hold unstable.

The TS250 will display time, date, peak weight, and time out (30 seconds).

3.5.18. MONORAIL

The Monorail feature provides the ability to manually Tare values that are smaller than the standard division size. This allows the user to Tare off smaller items, such as: trolley hook, banding materials, ect.

NOTE:

- Pounds and kilograms are the only available units of measure.
- This setting is designed for a 1000 lb. capacity and a 0.5 lb. division size scale.
- Auto Tare is disabled in this mode. All Tare values must be manually entered.
    - Manual Tare values of 0.1 lb. and 0.2 lbs. (pound mode); and 0.1 kg. (kilogram mode) will not be accepted. Values must be greater than 50 percent of standard division size.

Section 4: Accessories

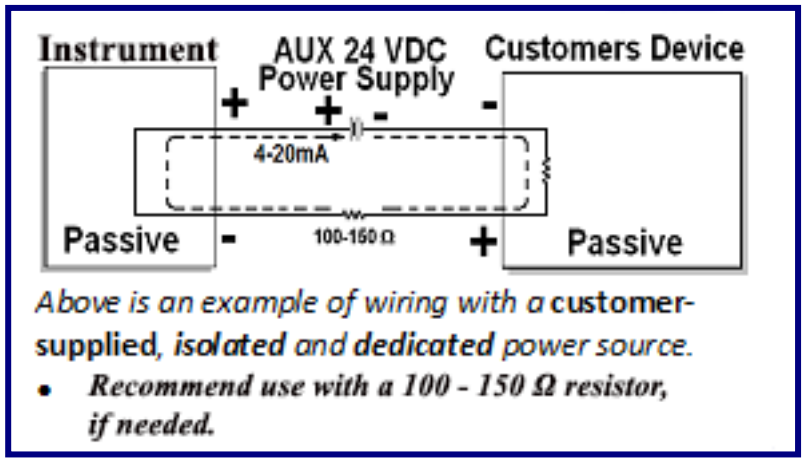
4.1. ATTACHING AN EXTERNAL POWER SUPPLY

4.1.1. REQUIREMENTS

When the customer's device is passive, an auxiliary power supply can be used to supply the voltage for the current loop.

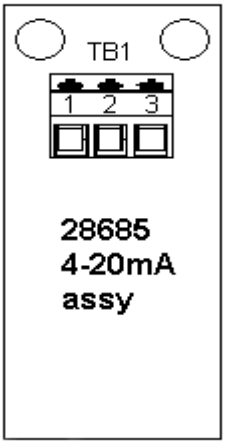
Output Conditions

FB2255 Condition	4-20mA analog output
Weight behind zero	3.5mA
Weight below 4.20 LO	3.5mA
Weight at 4.20 LO	4.0mA
Weight at 4.20 HI	20.0mA
Weight above 4.20 HI	24mA
Program Mode	Locked on last 4-20mA reading



Above is an example of wiring with a **customer-supplied,** ***isolated*** *and* ***dedicated*** *power source.*

- ***Recommend use with a 100 - 150 Ω resistor, if needed.***



Connections are as follows:

Pin 1	+ 4-20mA
Pin 2	– 4-20mA

- It is recommended to *disable the* **Sleep Mode** when the 4-20mA analog is used.
- **Loop Power** should be *turned off* whenever the FB2255 is turned off.
- See Section 10.3 for testing the 4-20mA module.

4.1.2. PROGRAMMING THE WEIGH MODE THAT THE OUTPUT TRACKS

NOTE: *Access to this feature is conditional, and depends upon whether it is enabled in the* ***FB2255 Internal Programming*** *(see section 3.7.2)*

1. Press and hold the **UNITS** key for three (3) seconds.
2. The display will show **4-20**, followed by the current setting.
   a. Gross
   b. Net
3. (A) To keep the current setting, press the **right arrow** key.
   (B) To change the setting:
   Press the **MENU** key
   Then use the **right arrow** key to toggle the available settings
   Press the **ENTER** key to select the desired option.

NOTE: The **4-20mA Analog Output** will continue to track the selection regardless of the currently selected Weigh Mode.

4. When complete, the program will advance to the 4mA menu.

4.1.3. PROGRAMMING THE 4MA WEIGHT VALUE

1. **4.20 Lo** displays, followed by the current setting.
2. If the output needs fine-tuned, use the **TARE** or **PRINT** keys to adjust. **Adj Lo** displays.
3. Press **ZERO** to return to the weight settings.
4. Press the **ZERO** to edit, or press the **UNITS** key to skip.
   a. The most significant digit will be blinking, operate the **UNITS** key to increment the number.
   b. When the desired value has been obtained, Press the **ZERO** key.
   c. The next less significant digit will then blink, operate the **UNITS** key to increment the number.
   d. Repeat steps b and c until the least significant digit has been completed.

   This weight value will result in a **4mA Output**.
5. When complete, the program will advance to the 20mA menu.

4.1.4. PROGRAMMING THE 20MA WEIGHT VALUE

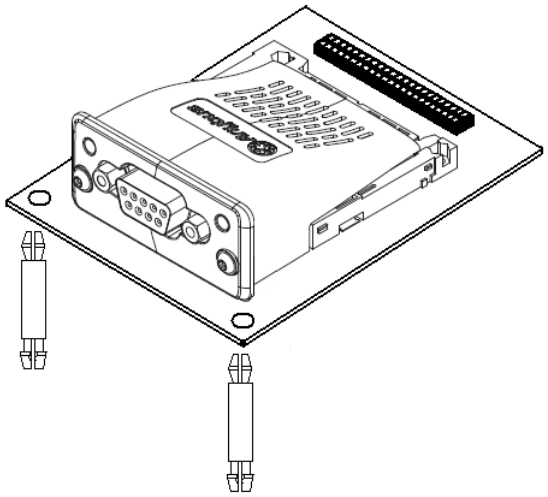
1. **4.20 Hi** displays, followed by the current setting.
2. If the output needs fine-tuned, use the **TARE** or **PRINT** keys to adjust. **Adj Hi** displays.
3. Press **ZERO** to return to the weight settings.
4. Press the **ZERO** key to edit or press the **UNITS** key to skip.
   a. The most significant digit will be blinking, operate the **UNITS** key to increment the number.
   b. When the desired value has been obtained, Press the **ZERO** key.
   c. The next less significant digit will then blink, operate the **UNITS** key to increment the number.
   d. Repeat steps b and c until the least significant digit has been completed.

   This weight value will result in a **20mA Output**
5. When complete, the **TS250** will return to weigh mode.

NOTE: Fine tune adjustment is available in firmware version 2.04 and after.

4.2. FIELDBUS

Thurman Scale offers five different fieldbus devices modules; PROFIBUS®-DP, ControlNet®, DeviceNet™, Modbus®, and Ethernet/IP.



The fieldbus card is factory installed onto an adapter.

4.2.1. ETHERNET/IP ADDRESSING

The Ethernet/IP module uses Dynamic addressing using DHCP for address requests as the default. The data is transmitted continuously from this module. The IP address may be made static by downloading the IP Configuration Tool software from: https://www.anybus.com/support/file-doc-downloads/anybus-compactcom-30-series

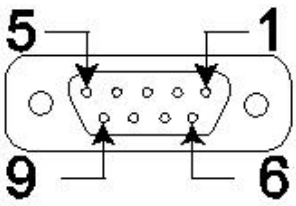
With this utility, it is possible to change the IP, Sub Net and Gateway addresses of an Ethernet/IP Module. To change an address, double click on the IP address field and enter the changes.

EtherNet/IP can be easily confused as a simple combination of EtherNet and the Internet Protocol. Instead, it is an **Industrial Application Layer Protocol** used for communication between industrial control systems and their components.

— Such components include Programmable Automation Controller, Logic Controller, or an I/O System.

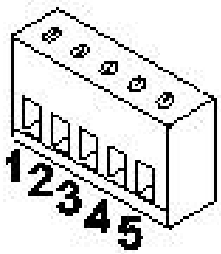
The “IP” in EtherNet/IP is not an abbreviation for “Internet Protocol”, but instead, it stands for “**Industrial Protocol**”.

4.3. FIELDBUS CONNECTIONS



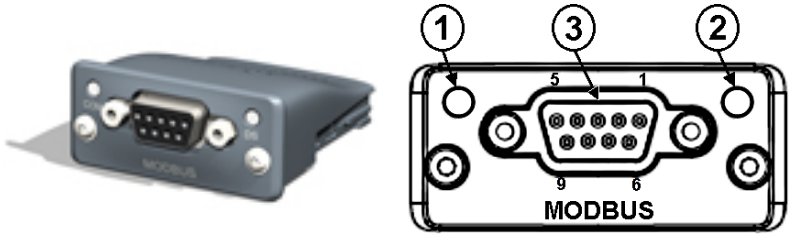
PROFIBUS® DP

Pin	Signal	Description
3	B Line	Positive RxD/TxD, RS485 level
4	RTS	Request to Send
5	GND	Ground (Isolated)
6	+5 Bus Output	+5V termination power (Isolated, short circuit protected)
8	A Line	Negative RxD/TxD, RS485 level



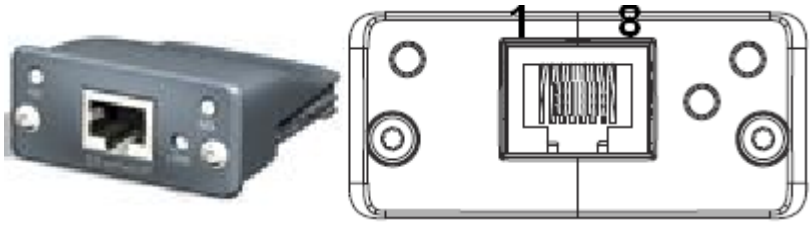
DeviceNet™

Pin	Signal	Description
1	V-	Negative bus supply voltage
2	CAN_L	CAN low bus line
3	SHIELD	Cable shield
4	CAN_H	CAN high bus line
5	V+	Positive bus supply voltage



Modbus®

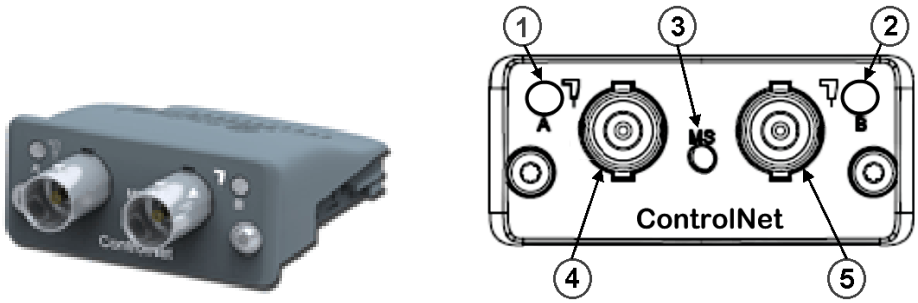
Pin	Signal	Description
1	GND	Bus polarization, ground (isolated)
2	5V	Bus polarizatino power +5V DC (isolated
3	PMC	Connect to pin #2 for RS-232 operation
5	B-LINE	RS-485 B-Line
7	RX	RS-232 Data Receive
8	TX	RS-232 Data Transmit
9	A-Line	RS-485 A-Line



Ethernet / IP

Use standard Cat 5 cable (RJ45)

Output data can be verified using the PC25X utility.



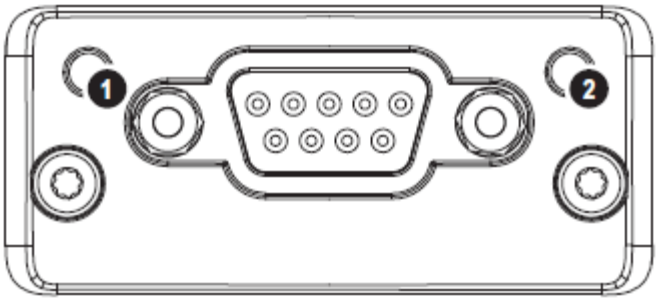
ControlNet

Uses a BNC connector cable.

Additional information available at:

https://www.anybus.com/support/file-doc-downloads/anybus-compactcom-30-series

4.4. PROFIBUS®-DP DIAGNOSTIC LEDs:



1: Operation Mode LED

2: Module Status LED

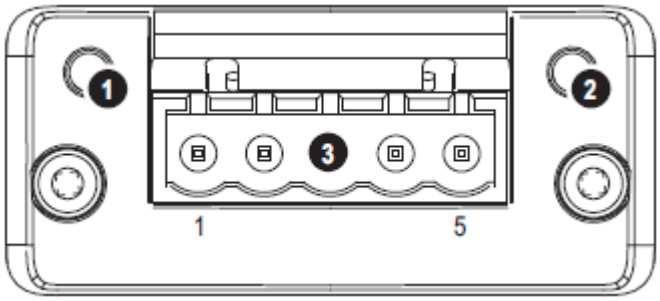
Operation Mode LED

State	Description	Comments
Off	Not online / No power	-
Green	Online / Data exchange	-
Flashing Green	Online, clear	-
Flashing Red (1 flash)	Parameterization error	See Parameterization data handling
Flashing Red (2 flashes)	Profibus configuration error	See Configuration data handling

Module Status LED

State	Description	Comments
Off	No power or not initialized	Module state=“SETUP” or NW_INIT”
Green	Initialized	Module has left the NW_INIT state
Flashing Green	Initialized, diagnostic event(s) present	Extended diagnostic bit is set
Red	Exception error	Module state = EXCEPTION

4.5. DEVICENET™ DIAGNOSTIC LEDs:



1: Network Status LED

2: Module Status LED

3: DeviceNet™ connector

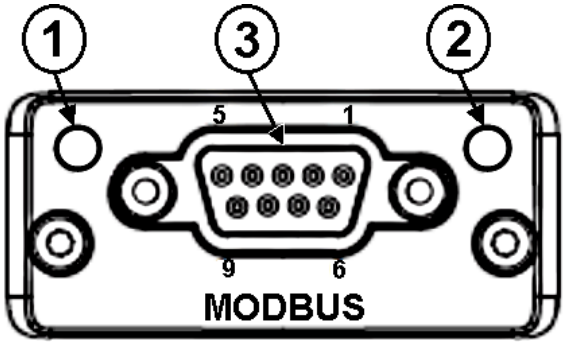
Network Status LED

State	Description
Off	Not online / No power
Green	Online, one or more connections established
Flashing Green (1 Hz)	Online, no connections established
Red	Critical link failure
Flashing Red (1 Hz)	One or more connections timed out
Alternating Red/Green	Self-test

Module Status LED

State	Description
Off	No power
Green	Operating in normal condition
Flashing Green (1 Hz)	Missing/incomplete configuration / Device needs commissioning
Red	Unrecoverable fault(s)
Flashing Red (1 Hz)	Recoverable fault(s)
Alternating Red/Green	Self-test

4.6. MODBUS® DIAGNOSTIC LEDS:



1: Communication LED

2: Device Status LED

3: Modbus® Interface

Communication LED

State	Description
Off	No power - OR - no traffic
Yellow	Frame reception or transmission
Red	A fatal error has occurred

Device Status LED

State	Description
Off	Initializine – *OR* – *n*o power
Green	Module initialized, no error
Red	Internal error – *OR* –major unrecoverable fault
Red, Single flash	Communication fault or configuration error **Case 1**: Invalid settings in Network Configuration error **Case 2**: Settings in Network Configuration Object has been changed during runtime (i.e. the settings do not match the currently used configuration)
Red, Double flash	Application diagnostics available

4.7. ETHERNET / IP DIAGNOSTIC LEDs:

1: Network Status LED
2: Module Status LED
3: Link/Activity
4: Ethernet Interface (RJ 45) (Standard Cat 5 cable)

Network Status LED

State	Description
Off	Not online / No power
Green	Online, one or more connections established
Flashing Green	Online, no connections established
Red	Duplicate IP address, FATAL error
Flashing Red	One or more connections timed out

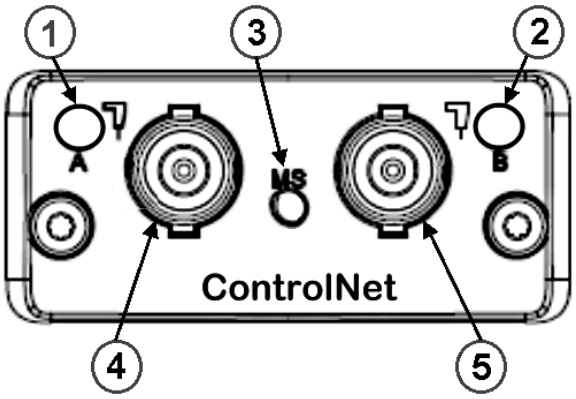
Module Status LED

State	Description
Off	No power
Green	Controlled by a scanner in Run state
Flashing Green	Not configures, or Scanner in idle state
Red	Major fault (EXCEPTION-state, FATAL error, etc.)
Flashing Red	Recoverable fault(s)

LINK / Activity LED

State	Description
Off	No link, no activity
Green	Link established
Green, flickering	Activity

4.8. CONTROLNET



No.	DESCRIPTION
1	Network Status LED **A**
2	Module Status LED
3	Network Status LED **B**
4	ControlNet Connector **A**
5	ControlNet Connector **B**

Network Status LEDS

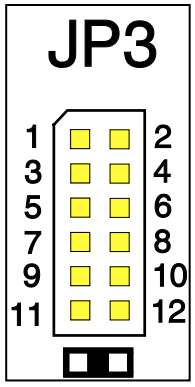
LEDS	State	Description
A and B	Off	Not online / No power
	Flashing Red (1 Hz)	Incorrect node configuration, duplicate MAC ID etc.
	Alternating Red/Green	Self test of bus controller
	Red	Fatal event or faulty unit
A or B	Off	Channel is disabled
	Alternating Red/Green	Invalid link configuration
	Flashing Green (1 Hz)	Temporary errors (node self-corrects) or node is not configured to go online.
	Green	Normal operation
	Flashing Red (1 Hz)	Media fault or no other nodes on the Network

Module Status LED

State	Description
Off	No power
Green	Operating in normal condition, controlled by a **Scanner in RUN state.**
Flashing Green(1Hz)	The module has not been configured or the Scanner is in the **Idle state.**
Red	Unrecovrerable fault(s), EXCEPTION,
Flashing Red(1Hz)	Media fault or no other nodes on the Network

Section 5: Serial Communication Wiring

5.1. JP3 JUMPER CONFIGURATION:



JP3	RS232	RS485	RS422*	Port
1-2	out	120 Ω resistor	120 Ω resistor	Com1
3-4	out	in	out	Com1
5-6	out	in	out	Com1
7-8	out	in	out	Com2
9-10	out	in	out	Com2
11-12	out	120 Ω resistor	120 Ω resistor	Com2

120 ohm termination resistors required if the receiver is the last node of the network

5.2. TB4 CONNECTIONS, COM1 (A), COM2 (B), AND COM2 (C)

TB4 (A)	RS232		RS485	RS422*	PORT
1	Rx – Receive Data		(–) RS485	RS422 (–) Rx	COM1
2	Tx – Transmit Data		(–) RS485	RS422 (–) Tx	COM1
3	CTS – Clear-to-Send		(+) RS485	RS422 (+) RX	COM1
4	GND -- Ground		GND	GND	COM1
5	RTS – Ready-to-Send		(+) RS485	RS422 (+) Tx	COM1

TB4 (B)	RS232	DB9 ABS ONLY	RS485	RS422*	PORT
1	Rx – Receive Data	2	(–) RS485	RS422 (–) Rx	COM2
2	TX – Transmit Data	3	(–) RS485	RS422 (–) Tx	COM2
3	CTS – Clear-to-Send	8	(+) RS485	RS422 (+) Rx	COM2
4	GND – Ground	5	GND	GND	COM2
5	RTS – Ready-to-Send	7	RS485	RS422 (+) Tx	COM2

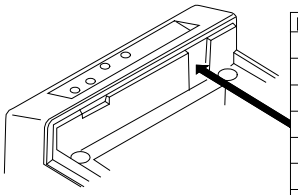
TB4 (C)	20MA		RS485	RS422	PORT
1	(+) TX – Transmit Passive, 20mA Output				COM2
2	(–) TX Passive, 20mA Output				COM2
3		(+) 7.5V Bluetooth® Technology Supply			

*Port should be set to RS485.

Section 6: Printer Installation

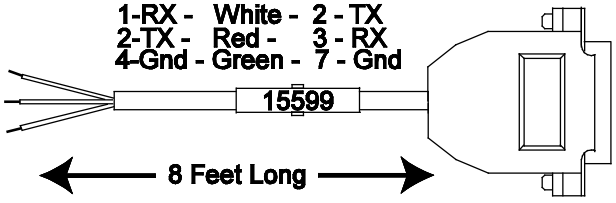
6.1. 3550 TAPE PRINTER

Transmission	**RS232**
Baud Rate	**9600**
Data Bits	**8**
Stop Bit	**1**
OUTPUT	**"BUTTON" for Print Key**



DS2	ON	OFF
1	X	
2	X	
3	X	
4		X
5	X	
6	X	
7		X
8		X

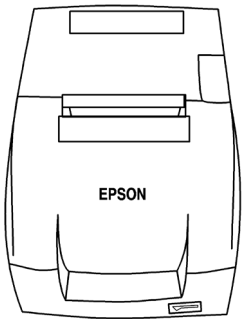
DS1	ON	OFF
1		X
2	X	
3	X	
4	X	
5		X
6		X
7		X
8	X	
9		X
10		X



Printer Cable (15599) *is used for both printers.*

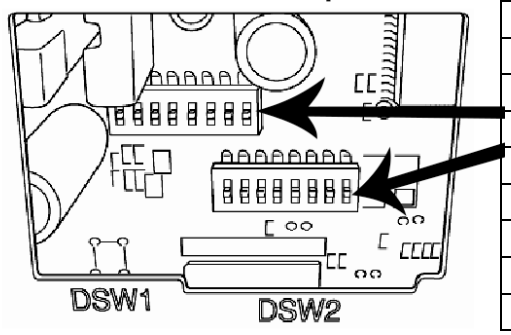
6.2. TM-U220 TAPE PRINTER

This is the TM-U220 Tape Printer (non-DAT, white case).



Transmission	**RS232**
Baud Rate	**9600**
Data Bits	**8**
Stop Bit	**1**
OUTPUT	**"BUTTON" for Print Key**

Bottom of TM-U220 Tape Printer

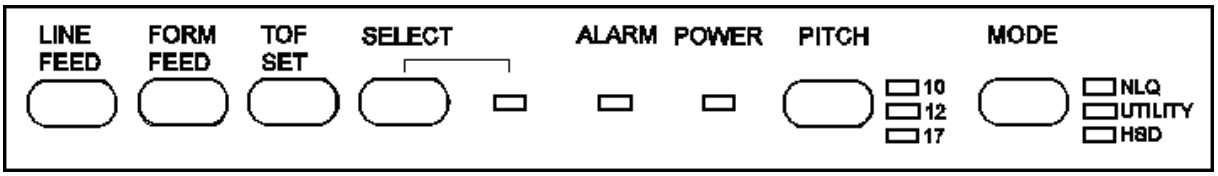


DS1	ON/OFF
1	OFF
2	OFF
3	OFF
4	OFF
5	OFF
6	OFF
7	OFF
8	OFF

DS2	ON/OFF
1	OFF
2	OFF
3	OFF
4	OFF
5	OFF
6	OFF
7	OFF
8	OFF

6.3. OKIDATA 186 T FORM PRINTER

The TS250 should be programmed for RS-232, 9600 baud, 8 data bits, and 1 stop bit. The OUTPUT setting should be “BUTTON” for the Print key.



To change Menu Settings:

1. To enter MENU MODE, press and hold SELECT while turning on the printer. The “12” and “UTILITY” LEDs will blink.

2. With the printer in the Menu Mode, press SELECT to print the complete menu. The current default settings print out. It is recommended to use tractor fed paper. NOTE: The printed menu selections are different for each emulation mode.

3. Press LINE FEED to select the relevant group that needs to be changed (the group is the left-hand column on the Menu printout).

4. Press FORM FEED to select the relevant item within the selected group (the Item is the center column on the Menu printout).

5. Press TOF SET to cycle through the settings available for the item you want to change (the settings are the right-hand column on the Menu printout).

6. To continue making changes: press LINE FEED for the next group or press FORM FEED for the next item. Repeat as needed until you are finished changing settings.

7. Press PITCH and MODE together to save the changes and exit the Menu Mode.

NOTE: Exiting the Menu Mode by turning off the printer will cancel any changed settings.

Printed menu changes per Printer Emulation Mode. If printer emulation mode is NOT set to ML, set this first, then reprint the menu. Then set menu as follows:

(GROUP) (press LINE FEED to change) change)	**(ITEM) (press FORM FEED to change)**	**(SET) (press TOF SET to**
Printer Control	Emulation Mode	ML
Font	Print Mode	Utility
Font	DRAFT Mode	SSD
Font	Pitch	10 CPI
Font	Proportional Spacing	No
Font	Style	Normal
Font	Size	Single
Symbol Sets	Character Set	Standard
Symbol Sets	Language Set	American
Symbol Sets	Zero Character	Slashed
Symbol Sets	Code Page	USA
Vertical Control	Line Spacing	6 LPI
Vertical Control	Skip Over Perforation	No
Vertical Control	Page Length	11”
Set-Up	Graphics	Bi-directional
Set-Up	7 or 8 Bits Graphics	7
Set-Up	Receive Buffer Size	128K
Set-Up	Paper Out Override	No
Set-Up	Paper Registration	0
Set-Up	7 or 8 Bits Data Word	8
Set-Up	Operator Panel Function	Full Operation
Set-Up	Reset Inhibit	No
Set-Up	Print Suppress Effective	Yes
Set-Up	Auto LF	No
Set-Up	Print DEL Code	Yes
Set-Up	Time Out Print	Invalid
Set-Up	Auto Select	No
Set-Up	Impact Mode	Normal
Parallel I/F	I-Prime	Buffer Print

Parallel I/F	Pin 18	+5v
Parallel I/F	Bi-Direction	Enable

Serial PCB Assy Switch Settings: (SW1) (** indicates typical Thurman setting)

Parity Type	Switch 1 (SW1)
** Odd parity	**ON**
Even parity	OFF

Parity	Switch 2 (SW1)
** No parity	**ON**
With parity	OFF

Data Bits	Switch 3 (SW1)
** 8 Bits	**ON**
7 Bits	OFF

Protocol	Switch 4 (SW1)
Ready/Busy	ON
** X-ON, X-OFF	**OFF**

Test Select	Switch 5 (SW1)
** Circuit	**ON**
Monitor	OFF

Mode Select	Switch 6 (SW1)
** Print mode	**ON**
Test mode	OFF

Busy Line Selection	Switch 7, 8 (SW1)
SSD- Pin 11	OFF, ON
SSD+ Pin 11	OFF, OFF
** DTR- Pin 20	**ON, ON**
RTS- Pin 4	ON, OFF

(SW2) (** indicates typical Thurman setting)

Transmission Speed	Switches 1, 2, 3 (SW2)
19,200 bps	ON, ON, ON
** 9,600 bps	**OFF, ON, ON**
4,800 bps	ON, OFF, ON
2,400 bps	OFF, OFF, ON
1,200 bps	ON, ON, OFF
600 bps	OFF, ON, OFF
300 bps	ON, OFF, OFF
110 bps	OFF, OFF, OFF

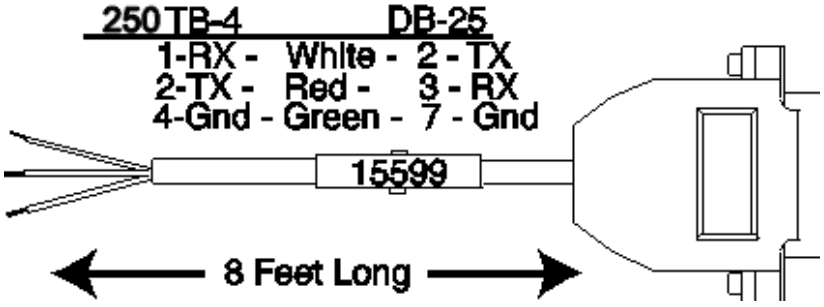
DSR Input Signal	Switch 4 (SW2)
Active	ON
** Inactive	**OFF**

Buffer Threshold	Switch 5 (SW2)
32 bytes	ON
** 256 bytes	**OFF**

Busy Signal Timing	Switch 6 (SW2)
** 200 ms minimum	**ON**
1 second minimum	OFF

DTR Signal	Switch 7 (SW2)
** Space after power on	**ON**
Space when printer is selected	OFF

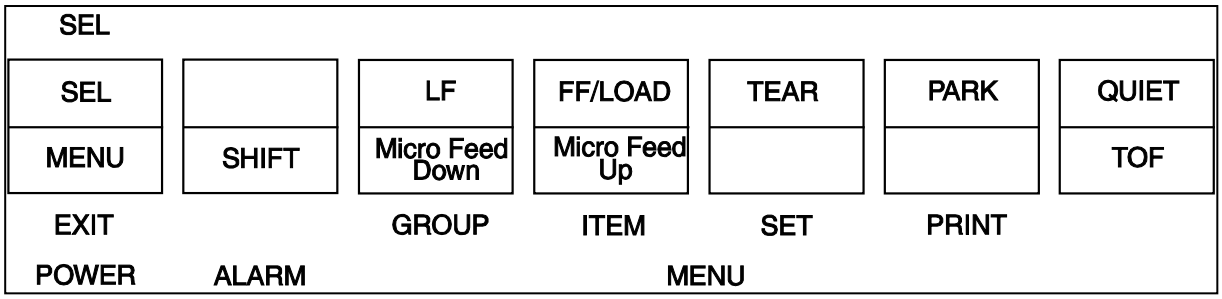
Not Used	Switch 8 (SW2)
**	**OFF**



6.4. OKIDATA 420 FORM PRINTER

The TS250 should be programmed for RS 232, 9600 baud, 8 data bits, and 1 stop bit. The OUTPUT setting should be “BUTTON” for the Print key.

To change Menu Settings:



1. To enter MENU MODE, press and hold the SHIFT key while pressing the SELECT key. The “MENU” legend will be illuminated while in the menu mode.

2. With the printer in the Menu Mode, press PRINT to print the complete menu. The current default settings print out. It is recommended to use tractor fed paper. NOTE: The printed menu selections are different for each emulation mode.

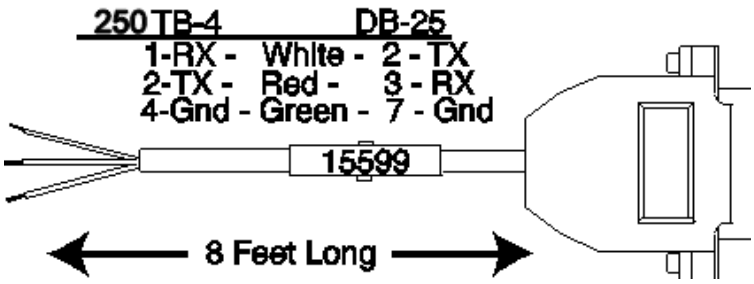
3. Press GROUP to select the relevant group that needs to be changed (the group is the left-hand column on the Menu printout).

4. Press ITEM to select the relevant item within the selected group (the Item is the center column on the Menu printout).

5. Press SET to cycle through the settings available for the item you want to change (the settings are the right-hand column on the Menu printout).

6. Press and hold the SHIFT key while pressing the SELECT.key exit the Menu Mode.

Note: If you turn off the printer before exiting the menu mode, any changes will be lost.



(GROUP) (press LINE FEED to change) change)	(ITEM) (press FORM FEED to change)	(SET) (press TOF SET to
Printer Control	Emulation Mode	IBM PPR
Font	Print Mode	Utility
Font	DRAFT Mode	HSD
Font	Pitch	10 CPI
Font	Proportional Spacing	No
Font	Style	Normal
Font	Size	Single
Symbol Sets	Character Set	Set 1
Symbol Sets	Language Set	American
Symbol Sets	Zero Character	Slashed
Symbol Sets	Code Page	USA
Rear Feed	Line Spacing	6 LPI
Rear Feed	Form Tear-off	Off
Rear Feed	Skip Over Perforation	No
Rear Feed	Page Length	11”

Bottom Feed	Line Spacing	6 LPI
Bottom Feed	Form Tear-off	Off
Bottom Feed	Skip Over Perforation	No
Bottom Feed	Page Length	11”

Top Feed	Line Spacing	6 LPI
Top Feed	Form Tear-off	Off
Top Feed	Skip Over Perforation	No
Top Feed	Page Length	11”

Set-Up	Graphics	Uni-directional
Set-Up	Receive Buffer Size	64K
Set-Up	Paper Out Override	No
Set-Up	Print Registration	0
Set-Up	Operator Panel Function	Full Operation
Set-Up	Reset Inhibit	No
Set-Up	Print Suppress Effective	Yes
Set-Up	Auto LF	No
Set-Up	Auto Select	No
Set-Up	SI Select Pitch (10CP)	17.1 CPI
Set-Up	SI Select Pitch (12CPI)	12 CPI
Set-Up	Time Out Print	valid
Set-Up	Auto Select	No
Set-Up	Centering Position	DEFAULT
Set-Up	ESC SI Pitch	17.1 CPI
Set-Up	Power Saving	Enable
Set-Up	Power Save Time	5 Min

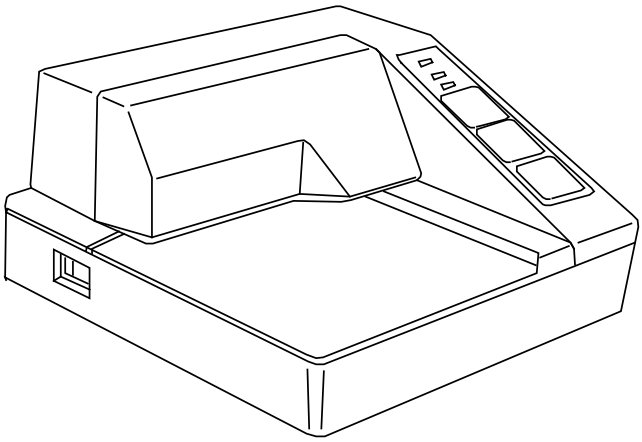
Parallel I/F	I-Prime	Buffer Print
Parallel I/F	Pin 18	+5v
Parallel I/F	Bi-Direction	Enable

Serial I/F	Parity	None
Serial I/F	Serial Data 7/8 Bits	8 Bits
Serial I/F	Protocol	X-On/X-Off
Serial I/F	Diagnostic Test	No
Serial I/F	Busy Line	SSD-
Serial I/F	Baud Rate	9600 BPS

Serial I/F	DSR Signal	Invalid
Serial I/F	DTR Signal	Ready on Pwr up
Serial I/F	Busy Time	200 ms

6.5. TM-U295 TICKET PRINTER

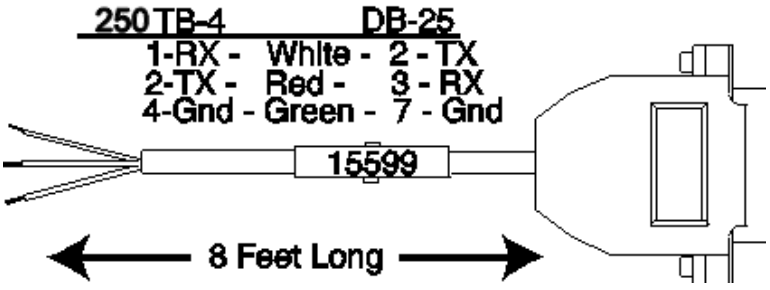
The TS250 should be programmed for RS232, 9600 baud, 8 data bits, and 1 stop bit. The OUTPUT setting should be “BUTTON” for the Print key.



Set the printer’s dip switches per the following:

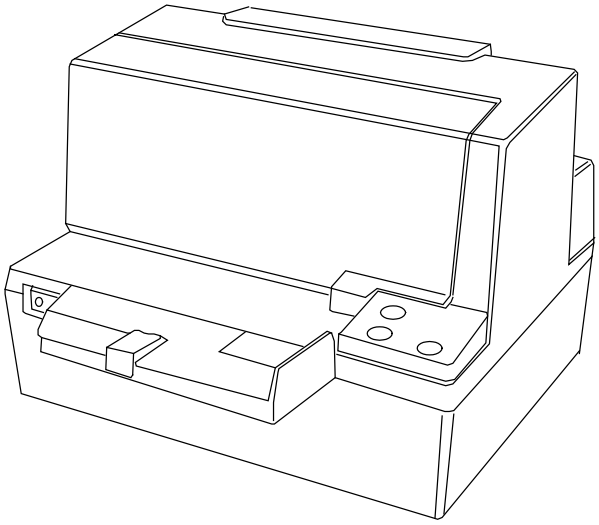
1 and 3 on, the rest off.

Cycle power to the printer after making switch changes.



6.6. TM-U590 TICKET PRINTER

The TS250 should be programmed for RS232, 9600 baud, 8 data bits, and 1 stop bit. The OUTPUT setting should be “BUTTON” for the Print key.

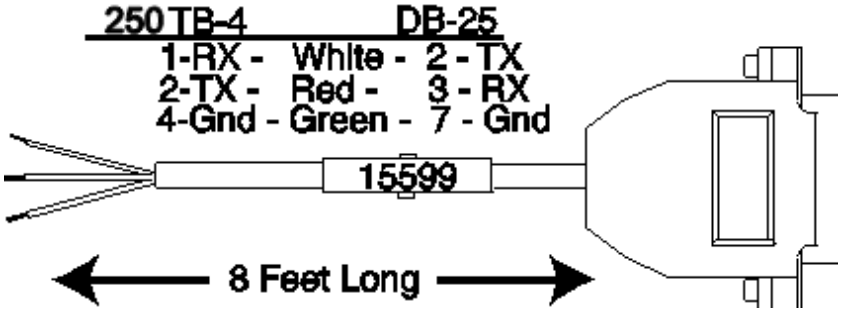


Set the printer’s dip switches per the following:

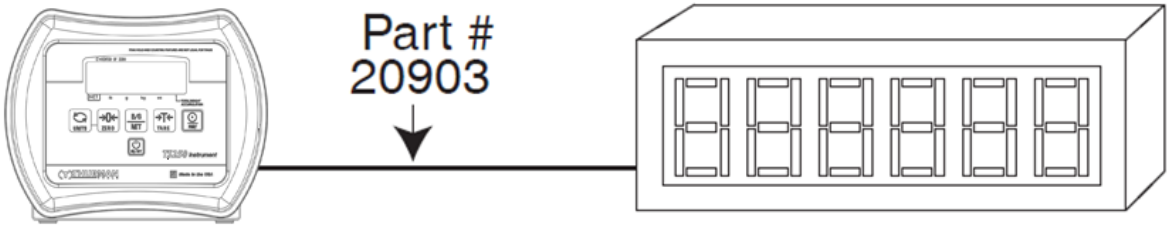
DSW 1: 1, 3, and 7 on only.

DSW 2: All off.

Cycle power to the printer after making switch changes.



6.7. 218 SERIES REMOTE DISPLAY



Using the **20mA Serial Current Loop Output** will allow transmission distances up to **1000 cable feet**.

– **Interface Cable** (**20903**) is recommended.

	Port **2**
Protocol	**C-Loop**
Baud	**9600**
Data Bits	**8**
Parity	**None**
Stop Bit	**1**
Output	**rDisp**

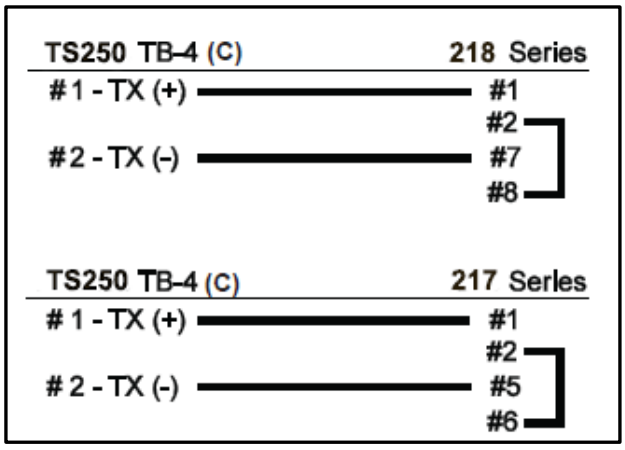
See Sections starting at 3.5.9 for COM Port 2 configuration programming.

The 218 Series remote display must be wired for **20mA Active**, and programmed to match the TS250.

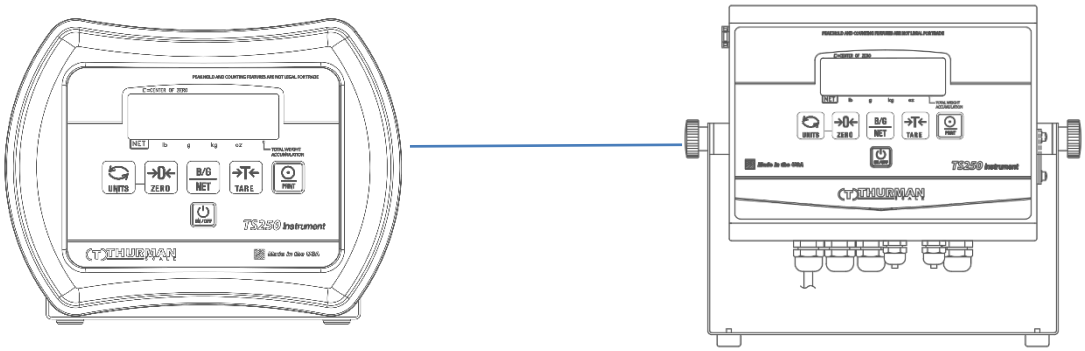
– Wiring to the TS250: **TB4 (C)** to the **Remote Display** (see section 2.7 or 5.4).

1	Tx + Passive 20mA Output
2	Tx – Passive 20mA Output

Wire the 218/217 Series **Remote Display** to the TS250 as shown in this diagram.



6.8. TS250 REMOTE DISPLAY



	TS250 (Master)	TS250 (Remote)
Port	1 or 2	1
Protocol	RS232	RS232
Baud Rate	9600	9600
Data Bits	8	8
Parity	none	none
Stop Bit	1	1
Output Type	POLL	Rd2250

- See Sections starting at 3.2.3 for Port 1 configuration programming.
- See Sections starting at 3.2.9 for Port 2 configuration programming.
- See Appendix III for wiring information.
- See Appendix IV for Remote Display Active Keys information.

NOTE: Remote Display will blank when connection to Master is terminated.

Section 7: PC25X Utility Software

7.1. INTRODUCTION

The PC25X utility software program can be used to set up and configure the TS250. It is required in order to program certain features such as custom units and custom ticket vector programming. The TS250 uses port 2 to communicate to the computer.

7.2. WIRING

Computer DB9 Pin 3 (TX) ----------TS250 TB4 Pin 6 (RX)
Computer DB9 Pin 2 (RX) ----------TS250 TB4 Pin 7 (TX)
Computer DB9 Pin 5 (GND) ----------TS250 TB4 Pin 9 (GND)

7.3. COMMUNICATION SETTINGS

1. Configure the TS250 Port 2 as noted in Table 1 below:

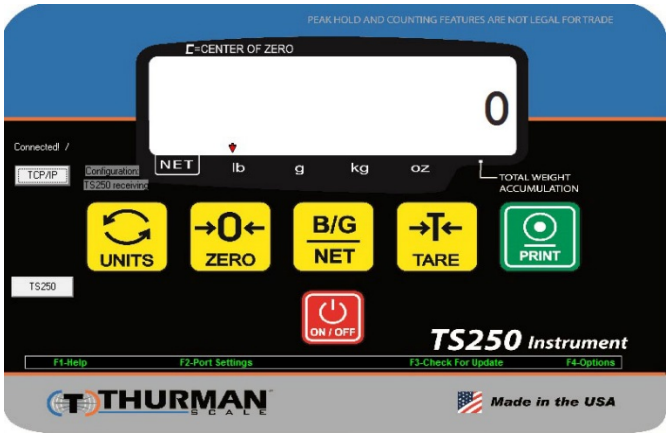
a. Press and hold the Internal Program Switch until **SetUP** displays. *(see section 3.1)*
b. Use the UNITS key to scroll through each menu item until **Port 2** displays
c. See Sections 3.5.9 – 3.5.14 for configuration instructions.
d. Exit to weigh mode.

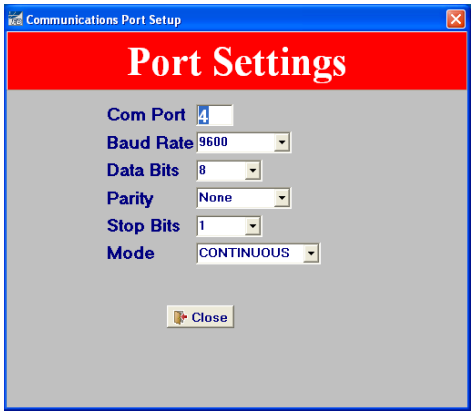
Baud Rate	**9600**
Data Bits	**8**
Parity	**None**
Stop Bit	**1**
Mode	**Continuous**

Table 1

2. On the PC Launch the **PC25X.exe** file.

– An image of the TS250 will display on the computer monitor.





3. Access the **COM Port Settings** of the computer by pressing **F2**.

4. Configure the Com Port connected to the TS250 via the pop-up menu to match the settings in Table 1 above.

5. Close the pop-up menu when complete.

6. To the left side of the weight display, the legend "**CONNECTED**" with a rotating baton will be displayed.
   - The weight display will duplicate what is shown on the TS250.

7. Left-clicking the mouse on any key will transmit that command to the TS250.
   – This excludes the **PRINT key.**

   – The legend **"COMMAND SENT!"** will display at the right.

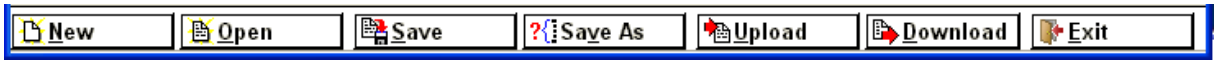
   – Mouse-clicking the **ON/OFF** key will terminate the PC25X software program.

Files

The default folder for all saved/uploaded parameter files is PC25X\SAVED

7.4. MENU BAR

The PC25X menu bar is located at the bottom of the display.



NEW: Loads the Parameters Menu with TS250 default settings.

OPEN: Opens the SAVED folder to select a file.

SAVE: Saves the currently named file.

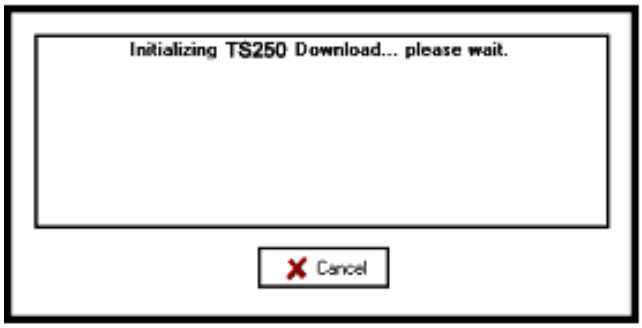
SAVE AS: Saves the current file and prompts for a file name.

UPLOAD: Uploads the current TS250 settings to the PC25X.

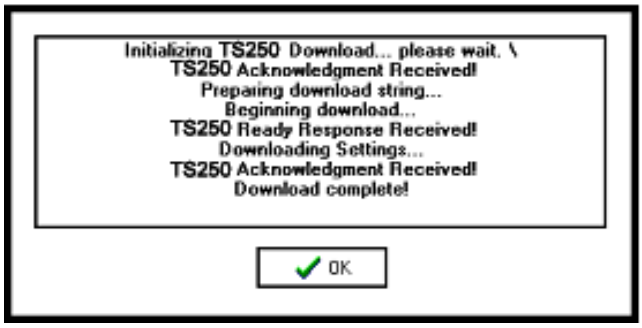
The TS250 will display “PC”. Press the Program switch inside the TS250.

When complete, click the “OK” button.

DOWNLOAD: Downloads the current PC25X settings to the TS250.



The TS250 will display “PC”. Press the Program switch inside the TS250.

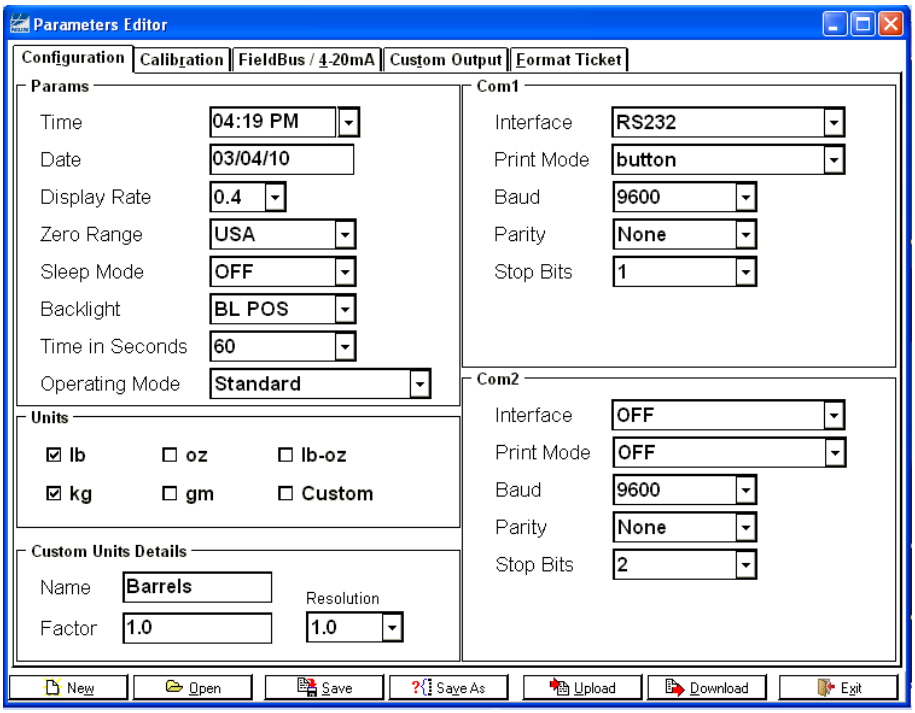


When complete, click the “OK” button.

EXIT: Closes the Parameter Editor.

Press or Click F4 to enter the Parameters Editor.

7.5. CONFIGURATION



Programming features is accomplished by using the mouse and:

Clicking the data item to highlight it, and then typing the replacement data.

Clicking the drop down arrow and selecting an available item.

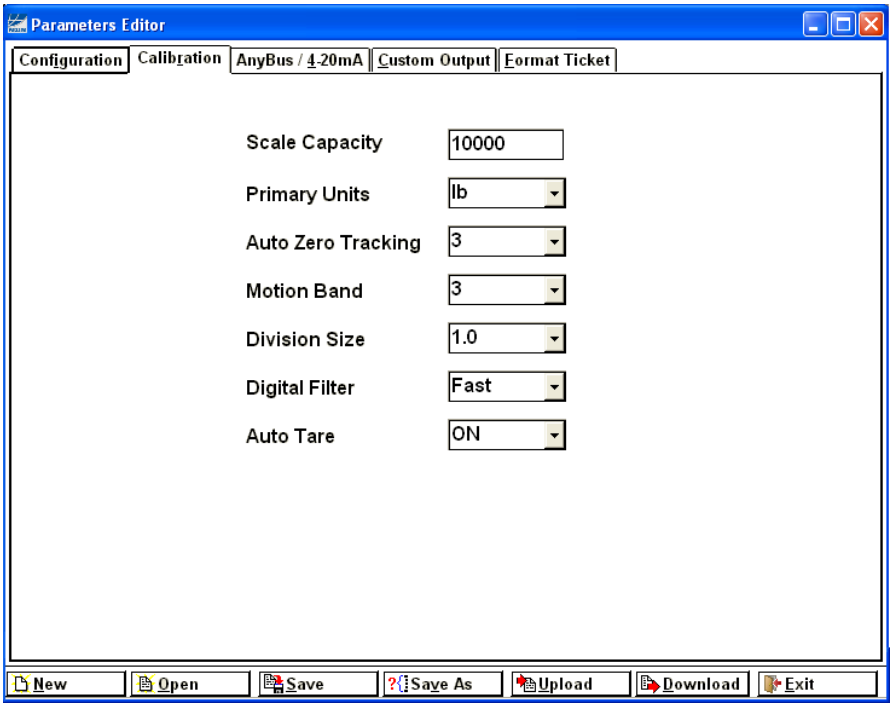
Clicking to provide a checkmark, which indicates the selection is active.

The custom unit factor is a conversion factor of the current primary weight data.

Custom Unit Programming example:

To convert lbs to dry barrels enter the conversion factor, resolution and custom legend, in the PC25X program. The current primary weight will be multiplied by the conversion factor, rounded off to the custom resolution and printed with a custom legend.

7.6. CALIBRATION



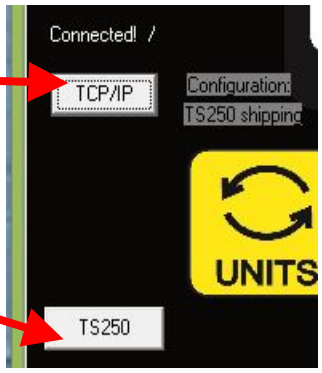
Settings include Scale capacity, Primary Units, Auto Zero Tracking, Motion Band (BAL), Division Size, Digital Filter, and Auto Tare settings. Actual test weight calibration is performed with the TS250 front panel keys.

7.7. FIRST TIME CONNECTION USING PC25X PC UTILITY AND TS25X ETHERNET TCP/IP OPTION

1. With the TS25X connected to the ethernet network, launch the PC25X PC Utility from the PC on the same network as the TS25X.

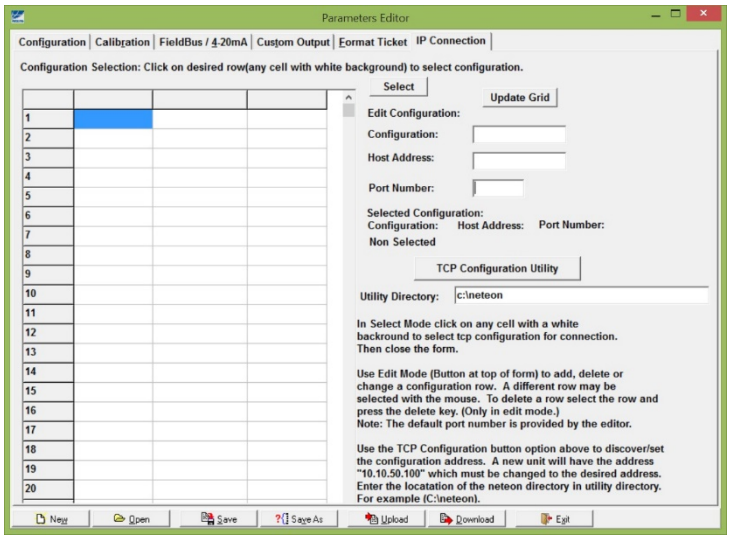
2. Change the interface from RS232 to TCP/IP by clicking on the button.

3. Select the PC Utility type based on the instrument you will be connecting to. Choose TS255 or TS250.

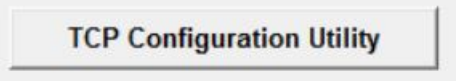


NOTE: If the ethernet card has been previously configured, skip to step 23.

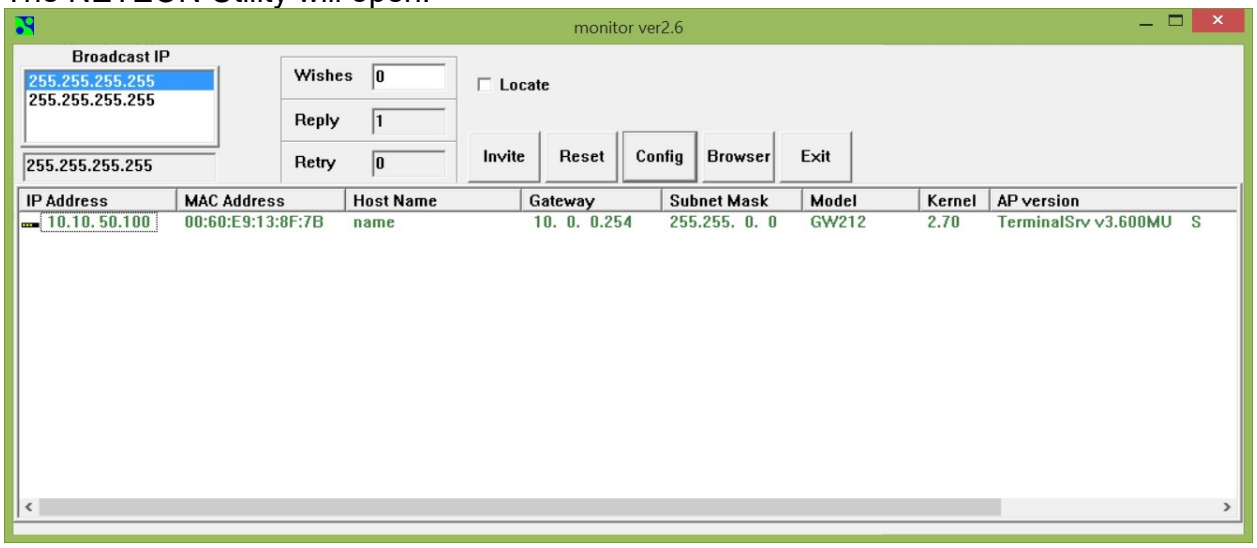
4. Click F4 to open the Configuration window.
5. Select the **IP CONNECTION** Tab.



6. Click the **TCP CONFIGURATION UTILITY** button.



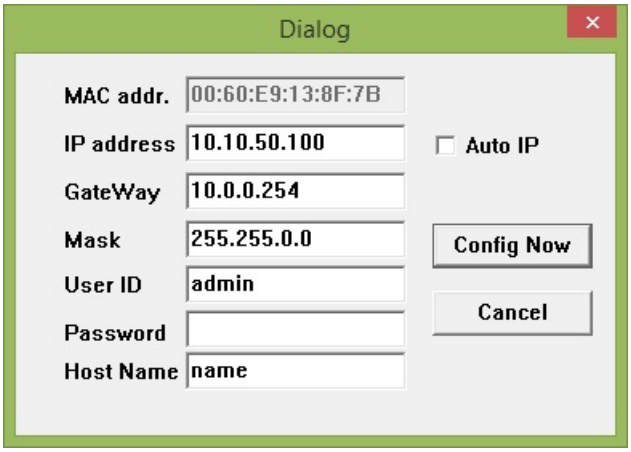
7. The NETEON Utility will open.



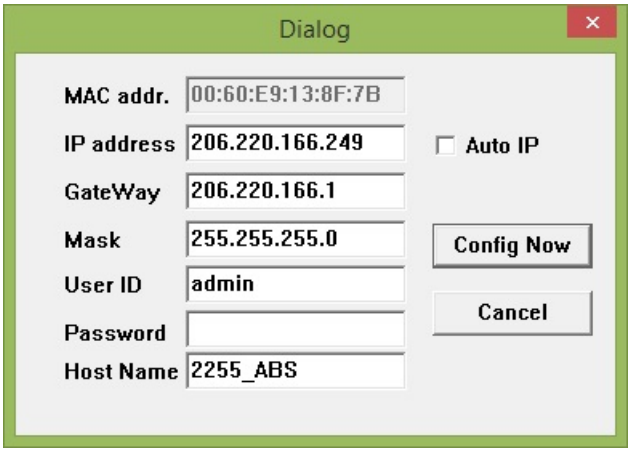
8. The default IP (10.10.50.100 or 10.0.50.100) of the ethernet device should show.

9. Highlight the IP address shown by clicking on it.

10. Select the **CONFIG** button. A new dialog box will open.



11. Obtain network setting details from the customer's IT personnel and enter the information in the dialog box.
    a. **NOTE:** AUTO IP sets the card to DHCP
12. Set the USER ID and PASSWORD
    a. Default = admin with no password
13. Highlight the IP address shown by clicking on it.

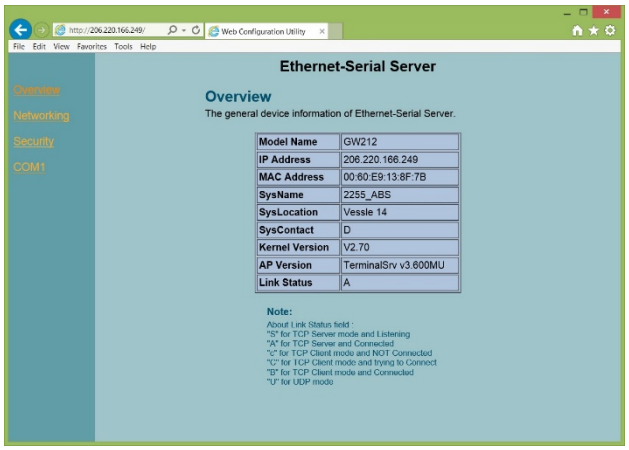


14. Click the **CONFIG NOW** button to write the change to the ethernet card.

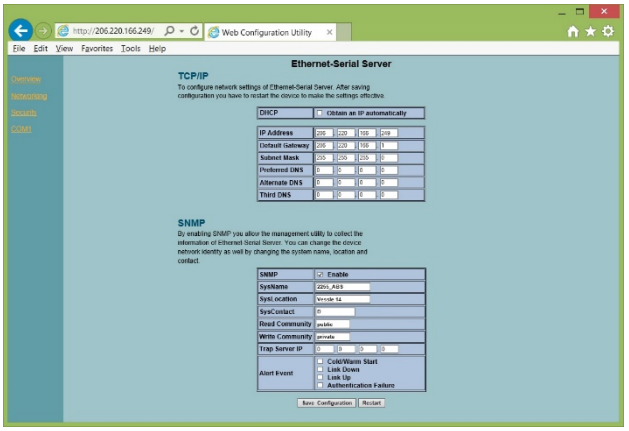
15. Click the **BROWSER** button.

16. You will be prompted for the USER ID and PASSWORD previously entered.

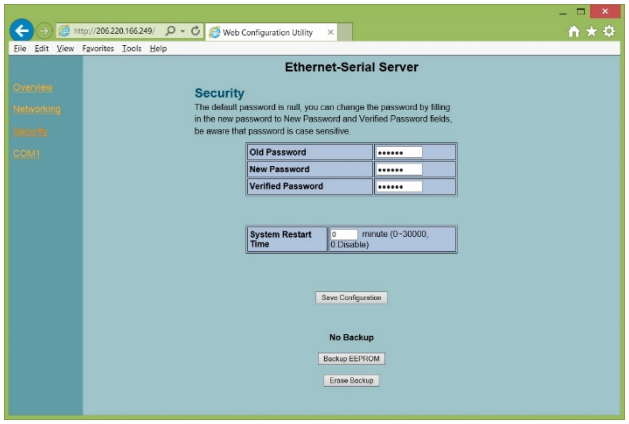
17. The **OVERVIEW** window will open showing the current addresses and settings for the ethernet card.



18. If additional network configuration is required, click the **NETWORKING** link.



19. To change the PASSWORD, click the **SECURITY** link.

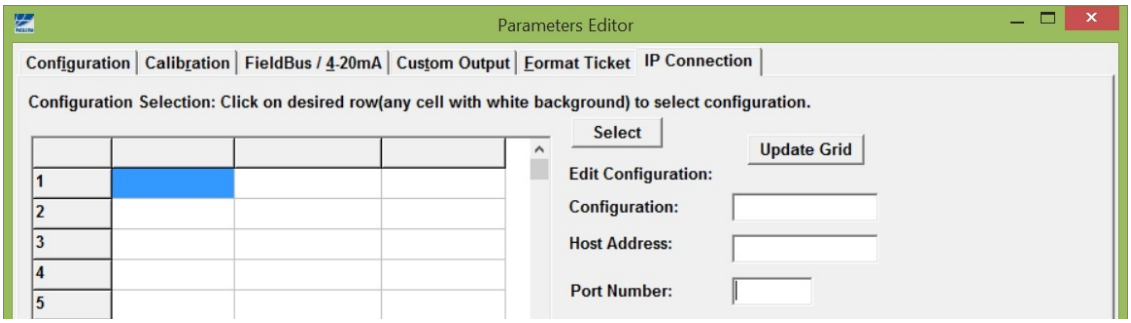


20. Do NOT make any changes under the COM1 link.
21. Close the browser window when you are done.
22. Click the **EXIT** button to close the configuration utility.

23. Return to the PC25X Utility and select the **IP CONNECTION** tab.

24. If the SELECT button is available, proceed to the next step, if it is not click on the EDIT button then proceed to the next step.

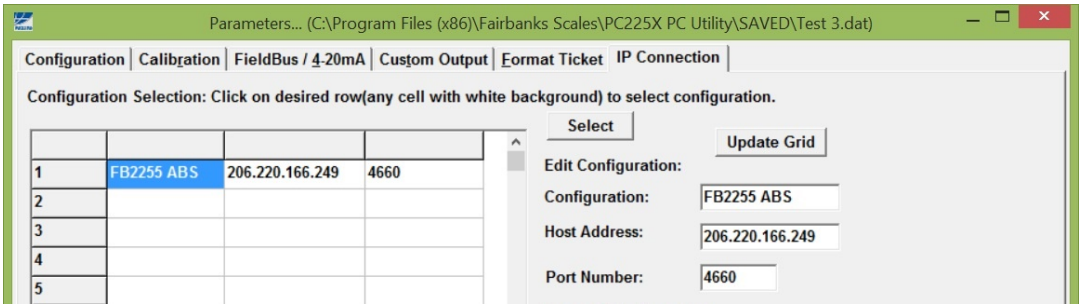
25. In the **CONFIGURATION** field, enter a human readable name to identify the TS25X instrument to connect to.



26. In the **HOST ADDRESS** field, enter the IP address for the TS25X being connected.

27. Default PORT NUMBER is 4660.

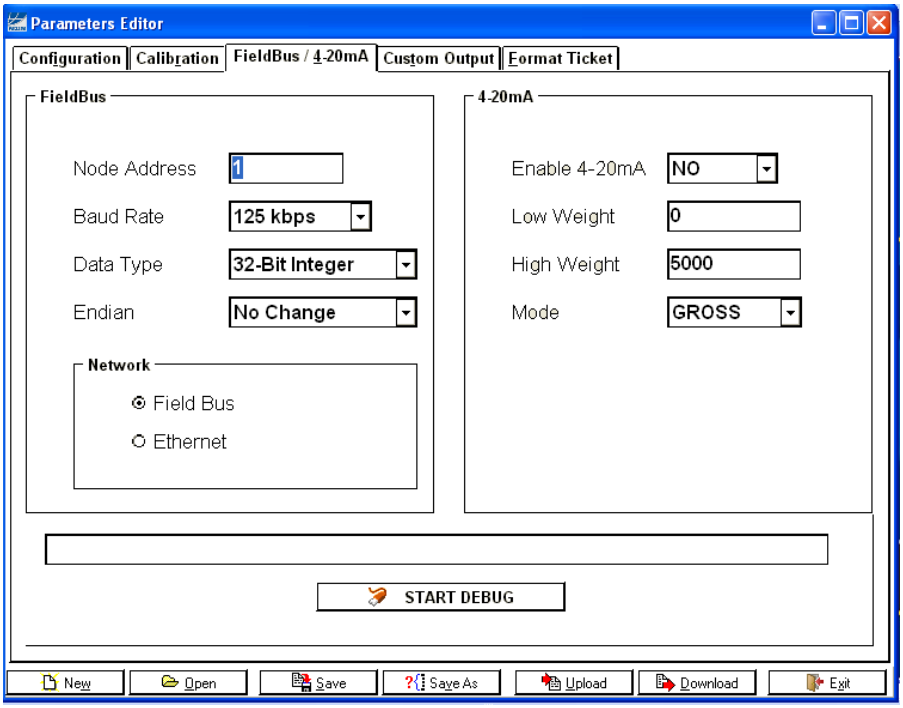
28. Once complete, select **UPDATE GRID**.



29. Save the PC25X Configuration file using the **SAVE AS** button.

30. Press **EXIT** to close the Configuration tool.
31. Weight should now display on the PC25X Utility.
32. The Utility will display the current IP Connect selected next to the TCP/IP button.
33. You can make Configuration changes, Upload and Download files from the PC25X Utility and the TS25X instrument.

7.8. FIELDBUS



The **Anybus Module** is set up using the **PC25X Program** and configures the following parameters listed below. The TS250 will automatically detect the Anybus module installed. No additional programming is required except the following parameters if necessary. The remainder of the fieldbus configuration and programming is performed on the fieldbus network side by the customer's network personnel.

PORT 20

As part of the Ethernet IP specification, the fieldbus device uses Port 20. This port cannot be changed. This is to ensure other devices on the network are able to communicate with each other.

Node Address

Enter the Node Address of the Module. This is typically furnished by the customer.

Baud Rate

Most anybus modules can automatically detect the network speed by using the Auto Baud feature. DeviceNet uses 125 bps, 250bps or 500bps.

Data Type

Data can be setup to output a 32 bit Integer word or a 32 bit floating point value.

Endian

The endianess of module is determined by the network type but can be changed from Little Endian to Big Endian or vice versa by using the "Change Order" setting

Little Endian Format or Intel Order

In little endian format, the least significant byte is stored first, followed by the next three more significant bytes. For example a 32bit value of 0x12345678 would be stored in Memory in Little Endian as;

Address + 0 0x78
Address + 1 0x56
Address + 2 0x34
Address + 3 0x12

Big Endian Format or Motorola Order

In big endian format, the most significant byte is stored first, followed by the next three least significant bytes. For example a 32bit value of 0x12345678 would be stored in Memory in Big Endian as;

Address + 0 0x12
Address + 1 0x34
Address + 2 0x56
Address + 3 0x78

OUTPUT

Data from the TS250 comprises of three (3) 32bit words; Gross Weight, Tare Weight and a 32bit Status word. Gross and Tare weights can be selected as either a 32bit Integer or 32bit floating point word.

The Most significant byte indicates the Weigh Mode "G" for Gross and "N" for Net. The next order byte indicates; "O" Overcapacity, "M" Motion of the last command received. (See INPUT Commands)

The next order byte indicates the weight units; "l" pounds, "k" kilograms, "o" ounces and "g" grams.

The least significant byte indicates the number of decimal places if the weight output is selected to be a 32bit Integer word. If a Floating point word is selected this byte will be 0.

INPUT

Single byte Commands can be sent from the network. Although the input is read as a 32 bit word only the least significant byte is used at this time. When the command is sent and recognized it is entered into the 32 bit status byte in the least significant command byte location. New commands can be transmitted after transmitting a NULL command.

Recognized Commands

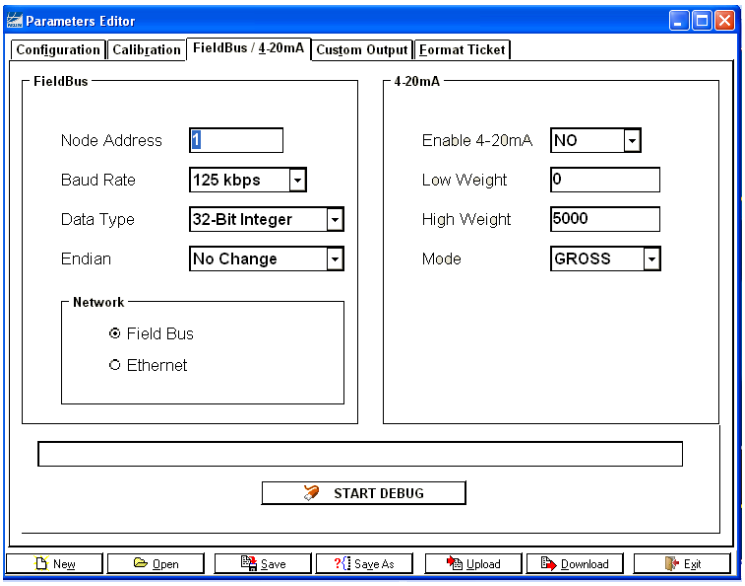
Print Stream (see Custom Format PC25X)
Print Format Stream; CR, SPACE, STX, ENQ or defined Poll Character
Tare: "A"
Print Ticket "p" / "P"
Zero "Z"
Change Gross Net Weigh Mode: "G"
Change Units: "U"

Debug

- Data in the Anybus Module can be examined by clicking the **START DEBUG** button.
- It is stopped by clicking the **STOP DEBUG** button.
- The Start Debug and Stop Debug provides a verification of the TS250 communicating with the fieldbus module by sending hexadecimal values which may be observed upon pressing start and stop debug.
- The **WRITE BUFFER** contains three 32-bit words.
- **Gross Weight, Tare Weight** and the **Status Word** is the data sent to the Network.
- The Contents of the **READ BUFFER,** which is the data received from the network, is displayed as a 32-bit word.

7.9. 4-20mA

A point-to-point or multi-drop circuit mainly used in the process automation field to transmit signals from instruments in the field to a controller. It sends an analog signal from 4 to 20mA that represents 0 to 100% of the weight displayed at the instrument. As a current loop signal, the TS250's 4-20mA output is a passive device which requires an **isolated and dedicated** power supply provided by others.



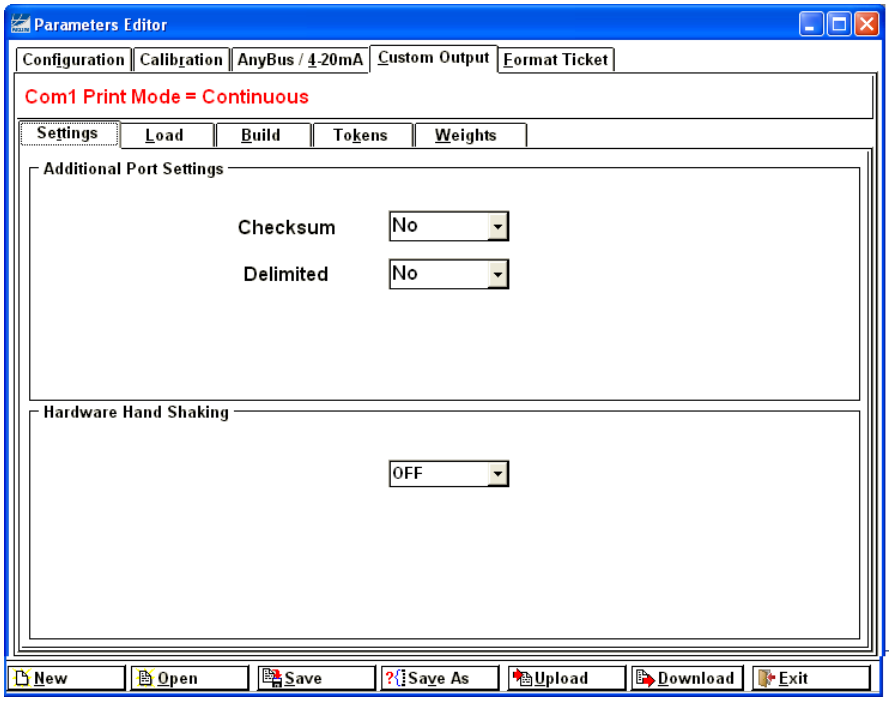
Enable 4-20mA – From the drop down menu, select YES to enable the output.

Low Weight – Enter the weight value which represents the 4mA output signal.

Weigh Weight – Enter the weight value which represents the 20mA output signal.

Mode – From the drop down menu, select weight mode which the 4-20mA will track, Gross or Net.

7.10. CUSTOM OUTPUT: SETTINGS



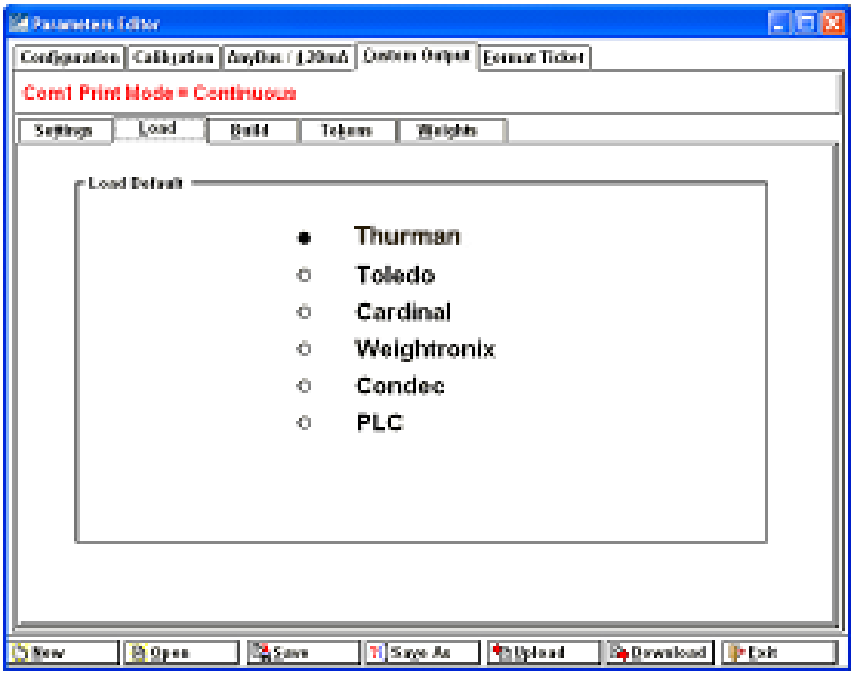
Checksum:

This setting determines whether a checksum character is enabled or not enabled. Checksum is an error detection method that checks the integrity of the entire string of data that is transmitted.

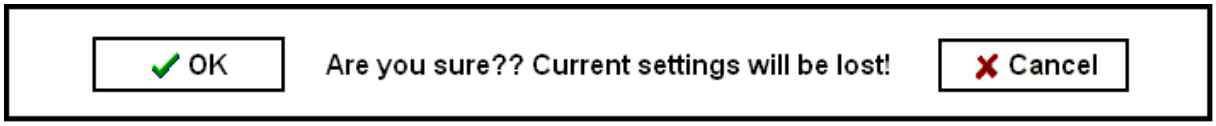
Delimited: This setting determines if a comma is added to the output string to separate data fields contained within the output string.

Hardware handshaking: No function. For future use.

7.11. CUSTOM OUTPUT: LOAD



A variety of pre-packaged output strings is available, click the radio button to select.



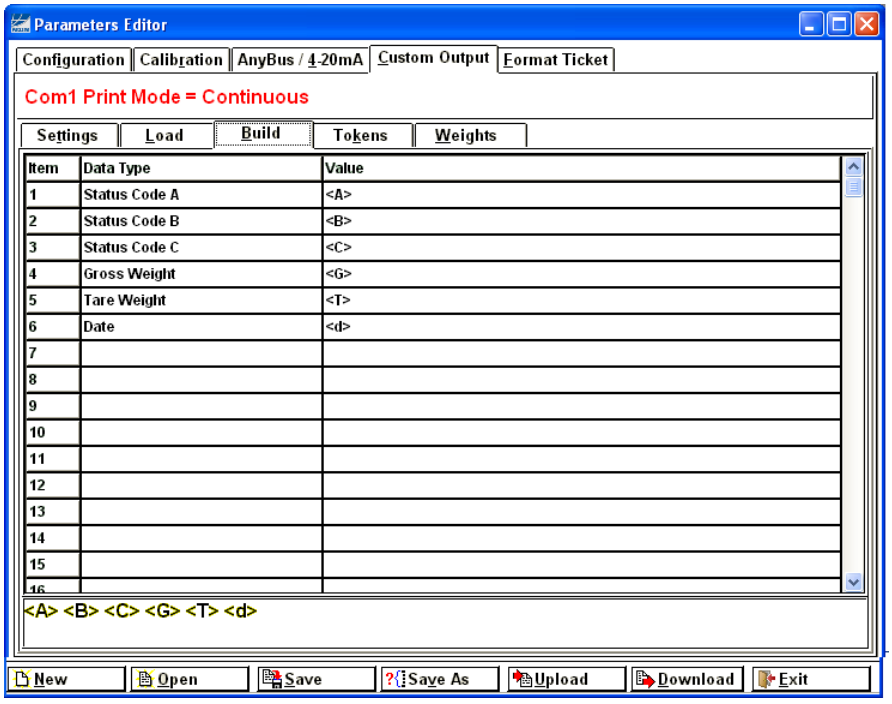
Upon selection, confirm or cancel. Refer to Appendix for data output structures.

NOTE: ***PLC*** *is no longer used and not a valid selection.*

NOTE for Rev 1.0 to 1.9: When custom outputs are formatted for Port 1, the TS250 Port 1 output must be set to "**print F**".

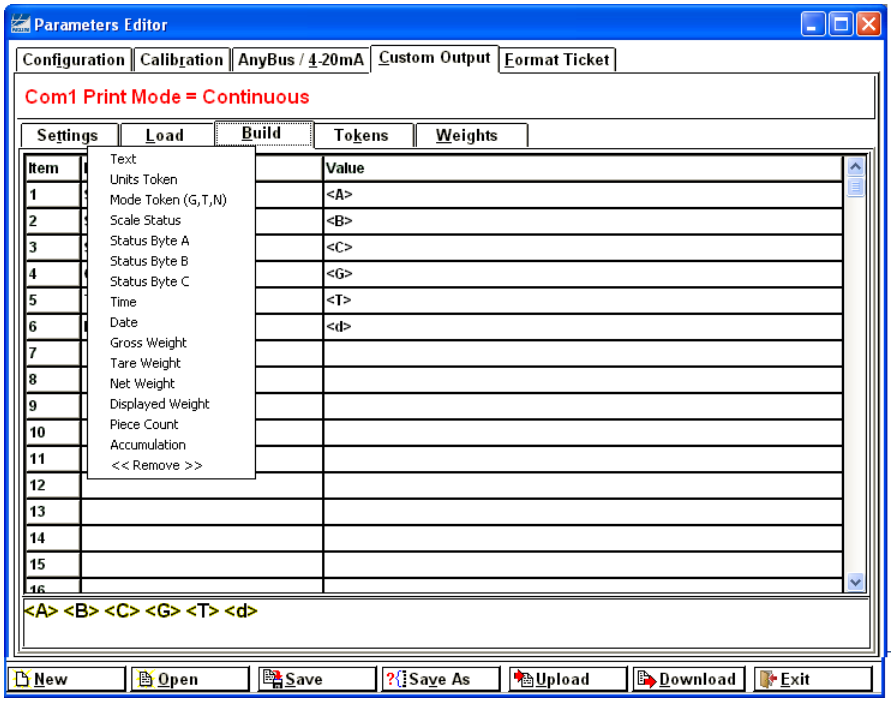
IMPORTANT NOTE: Whenever custom outputs are programmed for Port 2, upon completion the power MUST be cycled to the TS250 Instrument in order for them to take effect.

7.12. CUSTOM OUTPUT: BUILD



The data output string can be customized to suit the application requirements.

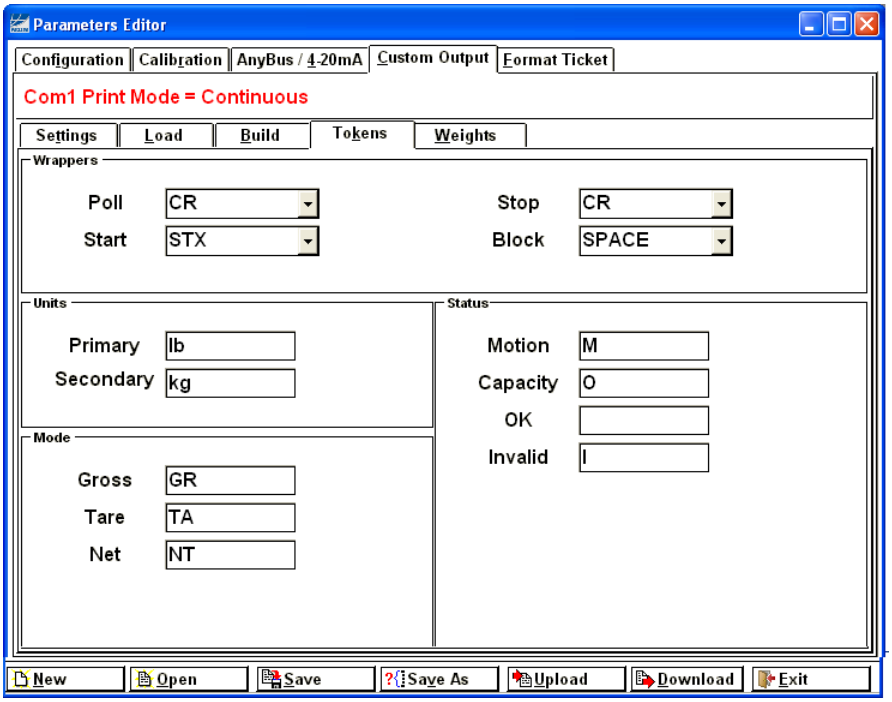
The current structure of the output string is displayed at the bottom, in order of transmission from left to right.



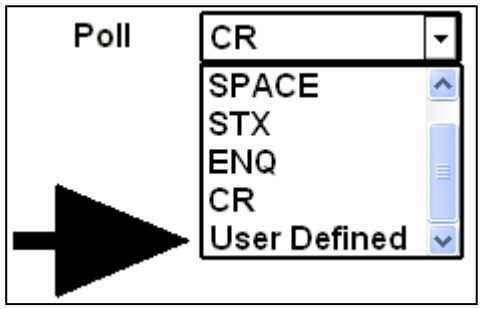
Changing data items is accomplished by right clicking the mouse in the selected “DATA TYPE” field.

This will open a selection window containing many different data items.

7.13. CUSTOM OUTPUT: TOKENS

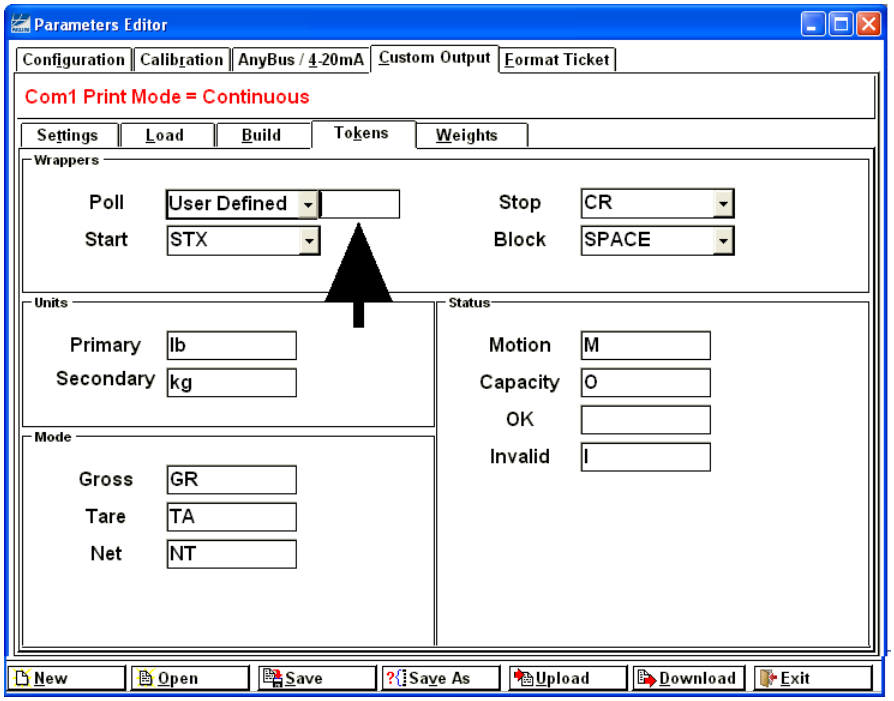


A wide variety of different characters can be selected for the polling character, as well as the start, stop, block, primary and secondary units, weighing mode, motion, and capacity characters.



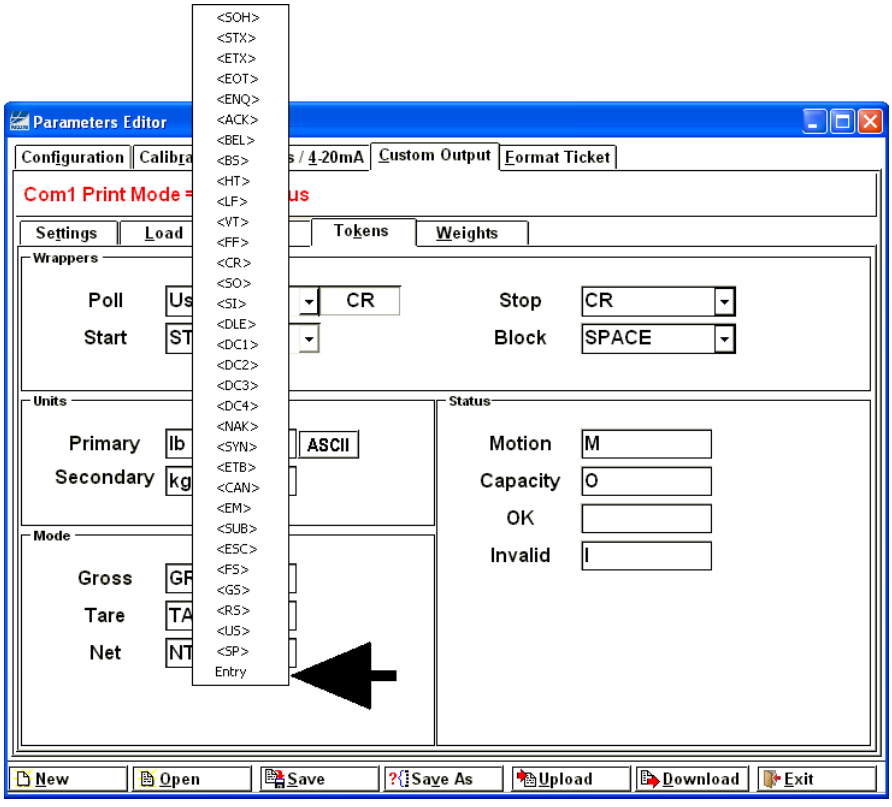
For selection of a character not listed, select

“USER DEFINED”



This will produce an additional data entry box as shown.

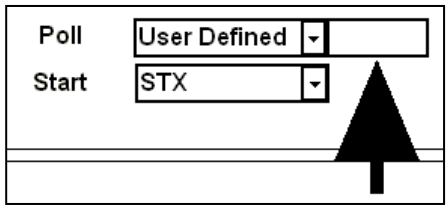
Selecting data items is accomplished by right clicking the mouse in the additional data entry box.



A selection such as <SOH> inserts a Start of Header character… otherwise known as a CTRL/A, or 0x01 HEX

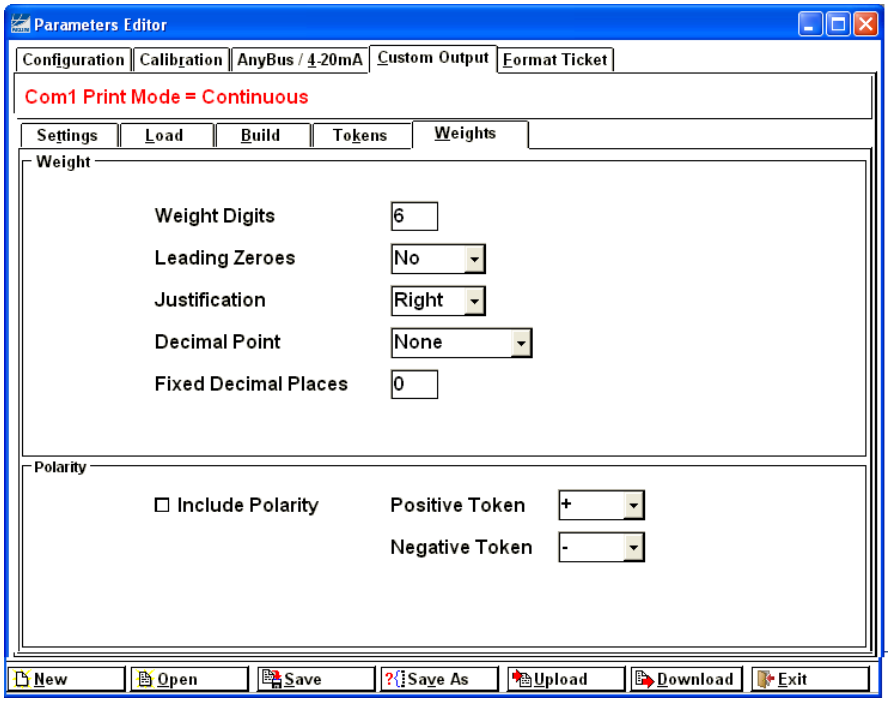
For selection of a character not listed, select

“Entry”.



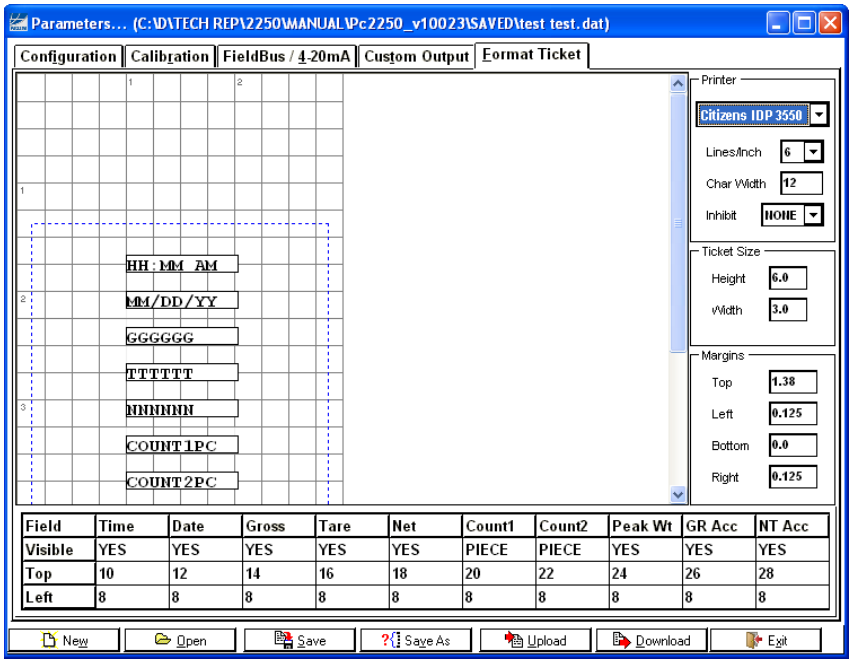
A Selection of Entry allows the user to enter a character using the keyboard, such as an ‘A’ or a ‘1’.

7.14. CUSTOM OUTPUT: WEIGHTS



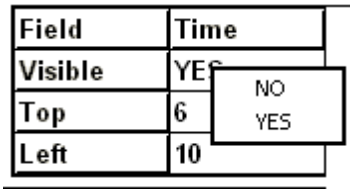
A variety of different settings is also available for the number of weight digits, whether leading zeroes are included or not, left or right justification, decimal point inclusion and type, decimal places, and positive and negative polarity designators.

7.15. FORMAT TICKETS



- Formatting tickets is easily performed with this drag and drop interface.
- The blue-dashes indicate the printable area of the ticket based on the ticket size and margins entered (by the user or by default).

1. Click on the drop down arrow to select the desired ticket **Printer**.
2. Click on the drop down arrow for **INHIBIT** to select either NONE, HIGH, or LOW.
3. Enter the **Ticket Size** and **Margins** in inches.
4. Items can be removed or added from view and printing by right clicking the **VISIBLE** box under the parameter, and then selecting **NO** or **YES**.



   a. Count1 options include:
      i. NO – not visible
      ii. PIECE – number of pieces
      iii. CNT GR. – Gross accumulated count
   b. Count2 options include:
      i. NO – not visible
      ii. PIECE – Total accumulated number of pieces
      iii. CNT NT – NET accumulated count
5. Click-and-hold on a data item in the ticket window to move it to a different location or manually change the numeric values for **TOP** and **LEFT**.

NOTE:

- Although the **Lines/ inch** and **Char Width** settings are sent to the printer and stored, they are not being used at this time (possible future use).
- Legends such as **GROSS** cannot be disabled, and are ***always included***.

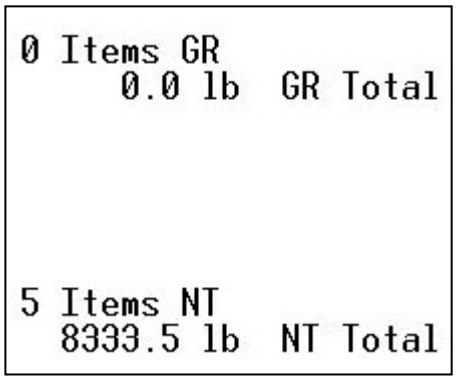
7.16. PRINTED EXAMPLES:

ACCUMULATION

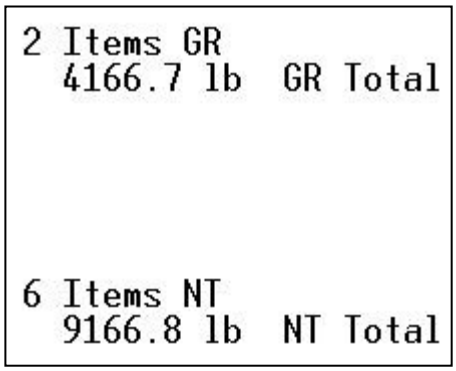
Field		Count1	Count2	Peak	GR	NT
Visible		CNT	CNT	NO	YES	YES
Top		14	16	0	20	22
Left		2	2	0	2	2

* See also 3.5.8. Weight Accumulation.

Here you see a sample ticket with 4 gross accumulations stored.



Here you see a sample ticket with 5 NET accumulations stored. Note that the Tare weight is not shown.



Gross weight and NET weight can be accumulated simultaneously in the TS250. Each Gross weight stored will be in its own register and each NET weight stored will be in its own register, completely independent from each other.

PIECE COUNT

Field	Time	Date	Gross	Tare	Net	Count1	Count2
Visible	YES	YES	YES	YES	YES	Piece	Piece
Top	2	2	6	8	10	14	16
Left	2	13	7	7	7	7	7

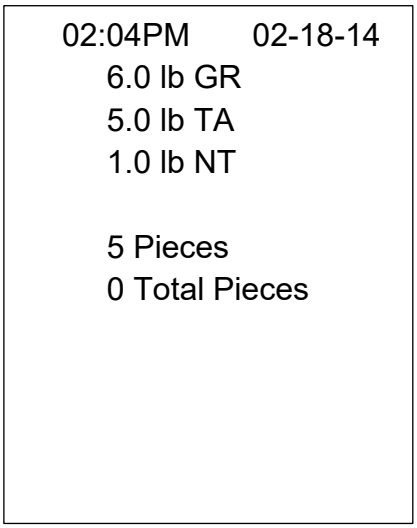
See 3.5.14 Piece Counting (in Operation)

Container weighs 5.0 lb.

5 pieces weigh 1.0 lb

Pieces cannot be accumulated.

When **PRINT** key was pressed, 5 pieces were still on the scale.



PIECE COUNT and TOTAL

Field	Time	Date	Gross	Tare	Net	Count1	Count2
Visible	YES	YES	YES	YES	YES	Piece	Piece
Top	2	2	6	8	10	14	16
Left	2	13	7	7	7	7	7

* See Section 3.5.15. Piece Count and Total (in Operation)

Container weighs 5.0 lb.

5 pieces weigh 1.0 lb

13 pieces have been accumulated previously before step 10 has been completed.

After step 10 was completed and when **PRINT** key was pressed, 5 pieces were still on the scale.

02:04PM 02-18-14
6.0 lb GR
5.0 lb TA
1.0 lb NT

5 Pieces
18 Total Pieces

PEAK WEIGHT

Field	Time	Date	Gross	Tare	Net	Count1	Count2	Peak Wt
Visible	YES	YES	YES	YES	YES	NO	NO	YES
Top	2	2	6	8	10	0	0	14
Left	2	13	7	7	7	0	0	2

* See Section 3.5.13 Peak Weight (in Operation)

Container weighs 5.0 lb

Item(s) in container weighs 11.0 lb

The peak weight applied to the scale to date was18.0lb Gross weight and occurred on 02-17-14 @ 01:04PM

02:04PM 02-18-14
16.0 lb GR
5.0 lb TA
11.0 lb NT

18.0 lb Peak Weight
02-17-14 01:04PM

Appendix I: Data Output Formats

A. GENERAL NOTES

<CR> = means carriage return character
<LF> = line feed character
<SP> = space character
<EOT> = end of transmission character
<…> = used to indicate individual characters for clarity only (not present in data stream)

Power must be cycled after each output download otherwise the TS250 will not save the downloaded data and will default to the previous setting.

B. THURMAN/ TOLEDO CONTINUOUS OUTPUT

<STX><A><B><C><WWWWWW><TTTTTT><CR>

A = Status Word A
B = Status Word B
C = Status Word C
W = Displayed Weight
T = Tare Weight

Leading zeroes are not suppressed. The Continuous Computer Output is an uninitiated, unrequested output that is transmitted at a fixed time interval.

Character String	Description
STX	Start of Text character : (02 Hex)
A	Status Word A
B	Status Word B
C	Status Word C
xxxxxx	Displayed Weight : x = Weight (6 characters if grad size does not have a decimal point.) (5 characters if the grad size does have a decimal point. The decimal point is not sent as part of the character string.
xxxxxx	Tare Value : x = Tare (6 characters if the grad size does not have a decimal point.) (5 characters if the grad size does have a decimal point. The decimal point is not sent as part of the character string
CR	Carriage Return Character : (0D hex)
CS	CheckSum Character : If enabled, this character consists of the last eight bits of the binary sum of all characters transmitted up to this checksum character.

Status Word A

Bit #				Decimal Point or Zero Location				
	x00	x0	x	x.x	x.xx	x.xxx	x.xxxx	x.xxxxx
0	0	1	0	1	0	1	0	1
1	0	0	1	1	0	0	1	1
2	0	0	0	0	1	1	1	1
				Increment Size				
Count by 1				Count by 2			Count by 5	
3	1			0			1	
4	0			1			1	
5				Always Logic 1				
6				Always Logic 0				
7				Parity Bit				

Status Word B

Bit #		Description
0	Gross = 0	Net = 1
1	Positive = 0	Negative = 1
2	In Range = 0	Overcapacity = 1
3	No Motion = 0	Motion = 1
4	lb = 0	kg = 1
5	Always Logic 1	
6	Normal = 0	Power Up = 1
7	Parity Bit	

Status Word C

Bit #		Description
0	Always Logic 0	
1	Always Logic 0	
2	Always Logic 0	
3	Normal = 0	Print Switch Pushed = 1
4	Always Logic 0	
5	Always Logic 1	
6	Normal = 0	Keyboard Tare = 1
7	Parity Bit	

C. CARDINAL 738 CONTINUOUS SCOREBOARD OUTPUT

<CR><P><WWWWWW><m><SP><U><SP><g><SPSP><ETX>

W = Displayed weight

P = Polarity + = Positive weight

- = Negative weight

U = Units

lb = pounds

kg = kilograms

m = Motion or o = Overload

g = Gross; n = Net

SP = Space

Leading zeroes are not suppressed

D. WEIGHTRONICS WI-120 CONTINUOUS OUTPUT

<G><P><WWWWWW><SP><U><CR><LF>

G = Gross; N = Net

P = Polarity + = positive weight

- = negative weight

U = Units

lb = pounds

kg = kilograms

SP = Space

Leading zeroes are not suppressed

E. CONDEC CONTINUOUS OUTPUT

<STX><P><WWWWWWW><U><G><M><CR>

P = Polarity space = positive weight

\- = negative weight

W = Displayed weight

U = Units

L = pounds

K = kilograms

G = Gross; N = Net

M = Motion

Leading zeroes are suppressed

F. DEMAND OUTPUT - DEFAULT

Activated by the receipt of a <CR>.

Gross Weight – No Motion – decimal points included

<SP> <W> <W> <W> <W> <W> <W> <SP> <l> <b> <SP> <SP> <G> <R> <SP> <SP> <CR> <LF> <EOT>

Gross Weight – Motion – decimal points included

<SP> <W> <W> <W> <W> <W> <W> <SP> <l> <b> <SP> <SP> <g> <r> <SP> <SP> <CR> <LF> <EOT>

Net Weight – No Motion – decimal points included

<SP> <W> <W> <W> <W> <W> <W> <SP> <I> <b> <SP> <SP> <N> <T> <SP> <SP> <CR> <LF> <EOT>

G. CONTINUOUS OUTPUT - DEFAULT

Outputs once every display update rate cycle.
Continuous Output formatted output. **Same for Poll and Auto**

Gross Weight – No Motion – decimal points included

<SP> <W> <W> <W> <W> <W> <W> <SP> <I> <b> <SP> <SP> <G> <R> <SP> <SP> <CR> <LF> <EOT>

Gross Weight – Motion – decimal points included

<SP> <W> <W> <W> <W> <W> <W> <SP> <I> <b> <SP> <SP> <g> <r> <SP> <SP> <CR> <LF> <EOT>

Net Weight – No Motion – decimal points included

<SP> <W> <W> <W> <W> <W> <W> <SP> <I> <b> <SP> <SP> <N> <T> <SP> <SP> <CR> <LF> <EOT>

Net Weight – Motion – decimal points included

<SP> <W> <W> <W> <W> <W> <W> <SP> <I> <b> <SP> <SP> <n> <t> <SP> <SP> <CR> <LF> <EOT>

H. PLC (DO NOT USE.)

The PLC selection is no longer functional within the PC25X software and should not be used or selected.

General Information

The information below is automatically configured by the TS250 and is provided as supplemental information only.

Continuous Output, transmitting data on every other A/D update

— Approximately 32 transmissions per second.

Baud Rate	**19,200**
Data Bits	**8**
Parity	**None**
Stop Bit	**1**
Mode	**Continuous**

The output string is **12 characters**, seen as "**wwwwwwwuumm<eot>**" where,

<wwwwwww> = Weight including decimal point and negative sign. Negative sign precedes most significant digit and may be preceded by space characters.

<uu> = units "lb", "kg", "oz", or "g ". "oz" may indicate ounces, or lb/ounces.

<mm> = mode "GR" or "NT" for stable weight, or "gr" or "nt" for motion.

<eot> = end of text.

Example 1: **Gross – lbs. – Weight Stable**

<WWWWWWW> <l><b> <G> <R> <EOT>

Example 2: **Gross – lbs. – Weight in Motion**

<WWWWWWW> <l> <b> <g> <r><EOT>

Example 3: **Net – kgs. – Weight Stable**

<WWWWWWW> <k> <g> <N> <T> <EOT>

Example 4: **Net – kgs. – Weight in Motion**

<WWWWWWW> <k> <g> <n> <t> <EOT>

NOTE*:* Once ***FIELDBUS OPTIONS*** have been programmed, the installing technician's setup is complete.

Specialized tools available from: https://www.anybus.com/support/file-doc-downloads/anybus-compactcom-30-series

Interface of the ***HMS COMMUNICATIONS*** device, power supply to same device, and programming of the PLC is strictly the responsibility of the customer.

I. UPS

- **Serial Data Output Format** for **UPS Worldship Software**.

The instrument will transmit the following string of data.

Character Number 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

String 1
Gross Weight: X X X X . X X SP l/k b/g SP G/g R/r SP SP CR LF EOT

NOTE:

- Characters denoted by **"X"** are characters **0-9**.
  - Leading zeroes are replaced with spaces (**SP**).
  - **Character 5** is a decimal point (**HEX 2E**).
- Lower case "l" and "b" for Avoirdupois Units, or "k" and "g" for Metrics Units.
- The first weight character will be a **minus** (**–**), **HEX 2D**, If weight is negative.
- Characters separated with a **"/"** denoted one of the characters will be transmitted.
  - Lower case **gr** in **characters 12** and**13** indicates scale motion.
  - Upper case indicates stable weight.
- **EOT, HEX 04** is transmitted in "**HiCAP**" condition.
- Transmission will occur when a **CR** (**Hex 0D**) carriage return is received.

J. P SHIP

- Serial Data Output Format for P Ship, used to interface to FedEx Shipping Programs.

All computer commands and scale responses are **ASCII Character Strings**, where:

<CR> is an ASCII carriage return (hexadecimal 0D)

<LF> is an ASCII line feed (hexadecimal 0A)

<ETX> is an ASCII End-Of-Text (hexadecimal 03)

(STATUS) is a two ASCII number representation of the scale status (in the form of hexadecimal 3x3x, where the bit pattern of the low nibbles, indicated by an "x", determine the actual status conditions)

COMPUTER RESPONSE	SCALE RESPONSE	COMMAND RESULT
W<CR>	<LF><SP>XXX.XXUU<CR>(STATUS)<ETX>	Returns the weight and scale status in two ASCII digits.
S<CR>	<LF>S(STATUS)<CR><ETX>	Returns the scale Status in two ASCII digits (defined in the following section)
Z<CR>	No response	Zeroes the scale
All Else	<LF>?<CR>	Unrecognizable command

Notes: In the scale response to "W<CR>":

1. **XXX.XX** = A five digit number with two digits to the right of the decimal point which is the displayed scale weight.

2. **SP** = An ASCII space (hexadecimal 20). In the event of a negative weight, an ASCII, "-" (hexadecimal 2D) is returned in this location.

3. **UU =** A two character weight identifier. If the scale is configured to weigh kilograms, a "KG" (uppercase letters) will be returned, if configured for pounds, "LB" (uppercase letters) will be returned.

4. The decimal point is returned by the scale as part of the ASCII string.

5. Interpretation of scale status digits

The high order nibble of each status byte has a value of 3 (0011 B). The low order nibble of the first and second bytes are defined as follows:

1st Byte:
Bit 0 - High = scale is in motion
Low = scale is stable
Bit 1 - High = scale at zero
Low = scale not at zero
Bit 2 - Low = not used
Bit 3 - Low = not used

2nd Byte:
Bit 0 - High = scale is below zero
Low = scale is not below zero
Bit 1 - High = scale is over capacity
Low = scale is not over capacity
Bit 2 - High = scale ROM program failure
Low = scale ROM okay
Bit 3 - High = faulty calibration data*
Low = scale calibration okay

*This is the result of an incorrect checksum

An example of the scale response to an "S" command would be:

<LF>S20<CR><ETX>

The following status conditions are in effect for this response:

- scale at zero
- scale is not below zero
- scale is not over capacity
- scale ROM okay
- scale calibration okay

Appendix II: ASCII Chart

Char	Dec	Hex
NUL	0	0
SOH	1	1
STX	2	2
ETX	3	3
EOT	4	4
ENQ	5	5
ACK	6	6
BEL	7	7
BS	8	8
HT	9	9
LF	10	a
VT	11	b
FF	12	c
CR	13	d
SO	14	e
SI	15	f
DLE	16	10
DC1	17	11
DC2	18	12
DC3	19	13
DC4	20	14
NAK	21	15
SYN	22	16
ETB	23	17
CAN	24	17
EM	25	19
SUB	26	1a
ESC	27	1b
FS	28	1c
GS	29	1d
RS	30	1e
US	31	1f
SP	32	20

Char	Dec	Hex
!	33	21
"	34	22
#	35	23
$	36	24
%	37	25
&	38	26
`	39	27
(	40	28
)	41	29
*	42	2a
+	43	2b
,	44	2c
-	45	2d
.	46	2e
/	47	2f
0	48	30
1	49	31
2	50	32
3	51	33
4	52	34
5	53	35
6	54	36
7	55	37
8	56	38
9	57	39
:	58	3a
;	59	3b
<	60	3c
=	61	3d
	62	3e
?	63	3f
@	64	40
A	65	41

Char	Dec	Hex
B	66	42
C	67	43
D	68	44
E	69	45
F	70	46
G	71	47
H	72	48
I	73	49
J	74	4a
K	75	4b
L	76	4c
M	77	4d
N	78	4e
O	79	4f
P	80	50
Q	81	51
R	82	52
S	83	53
T	84	54
U	85	55
V	86	56
W	87	57
X	88	58
Y	89	59
Z	90	5a
[	91	5b
\	92	5c
]	93	5d
^	94	5e
_	95	5f
`	96	60
a	97	61
b	98	62

Char	Dec	Hex
c	99	63
d	100	64
e	101	65
f	102	66
g	103	67
h	104	68
i	105	69
j	106	6a
k	107	6b
l	108	6c
m	109	6d
n	110	6e
o	111	6f
p	112	70
q	113	71
r	114	72
s	115	73
t	116	74
u	117	75
v	118	76
w	119	77
x	120	78
y	121	79
z	122	7a
{	123	7b
|	124	7c
}	125	7d
~	126	7e
DEL	127	7f

Appendix III: TS250 Remote Display Wiring

RS232 INTERFACE WIRING (Master)					TS250/255 REMOTE DISPLAY		
MODEL	**COM**	**CONNECT**			**COM**	**CONNECT**	
FAIRBANKS 2200 (ABS)	1	3	TX		1	TB4(A)-1	RX
	1	5	GND		1	TB4(A)-4	GND
FAIRBANKS 2200 (SS)	1	3	TX		1	TB4(A)-1	RX
	1	5	GND		1	TB4(A)-4	GND
TS255 or TS250	1	TB4(A)-2	TX		1	TB4(A)-1	RX
	1	TB4(A)-1	RX		1	TB4(A)-2	TX
	1	TB4(A)-4	GND		1	TB4(A)-4	GND
	2	TB4(B)-2	TX		1	TB4(A)-1	RX
	2	TB4(B)-1	RX		1	TB4(A)-2	TX
	2	TB4(B)-4	GND		1	TB4(A)-4	GND
IT-2000	1	TB4-1	TX		1	TB4(A)-1	RX
	1	TB4-2	GND		1	TB4(A)-4	GND
IS-3000	2, 3, 4 or 5	3	TX		1	TB4(A)-1	RX
		5	GND		1	TB4(A)-4	GND
IS-3000 (SS)	2, 3, 4 or 5	4	TX		1	TB4(A)-1	RX
		8	GND		1	TB4(A)-4	GND
FAIRBANKS 2800	A	TB3-2	TX		1	TB4(A)-1	RX
		TB3-4	GND		1	TB4(A)-4	GND
	B	TB2-2	TX		1	TB4(A)-1	RX
		TB2-4	GND		1	TB4(A)-4	GND
FAIRBANKS 5200A	1 or 2	4	TX		1	TB4(A)-1	RX
		5	RX		1	TB4(A)-2	TX
		8	GND		1	TB4(A)-4	GND

Appendix IV: Remote Display Active Keys

INSTRUMENT	TS250 ACTIVE FRONT PANEL KEYS
TS250	Units, Zero, Gross Net, Auto Tare, Print *
TS255	Units, Zero, Gross Net, Auto Tare, Print *
IT-2000	No Active Keys
IS-3000	No Active Keys

* The “master” TS25X must have the printer on COM 1 and COM 1 must be configured for **Button**. COM 2 of the “master TS25X must be configured for **Poll** and the TS25X acting as the remote display must be connected to COM 2 of the “master”.

Appendix V: Remote PC Commands

Transmitting certain ASCII characters to the TS250 will duplicate a key-press from a remote location via the RS 232 serial connection to Port 1. The baud rate, parity, and stop bits must match. The data bit length is 8 bits.

ASCII CHARACTER	FUNCTION PERFORMED / COMMENTS
Z (upper case)	Zero. Active in the Polled or Button Modes
A (upper case)	Tare (Auto Tare). Active in the Polled or Button Modes
U (upper case)	Change Units. Active in the Polled or Button Modes
g (lower case)	Toggle Gross / Net. Active in the Polled or Button Modes
P or **p** (either case)	'P' or 'p". Active in the Polled or Button Modes The output will be the same as if the instrument front panel switch is operated. This output is formatted via the PC25X program, using the 'Format Ticket' tab and can include any of the field items and in the order prescribed.
CR (upper case)	Carriage Return. Active in the Polled Mode Output will be the displayed weight, either Net or Gross. If Motion then "GR" and "NT" are transmitted as "gr" and "nt". Both strings are terminated with; Carriage Return, Line Feed, End Of Transmission, <CR><LF><EOT>

TS250 Series Instrument

TS250/ PC25X
Document 51367

Thurman Scale
4025 Lakeview Crossing
Groveport, OH 43125
http://www.thurmanscale.com/